The Builder.

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The London County Council Hall Competition.

FROM the agenda papers of the London County Council we learn the particulars, as proposed by the Establishment Committee, which are to form the basis of the instructions to architects who may take part in the competition. These proposals have not been yet formally considered and passed by the Council; and before they are we hope that two points in the proposals, at all events, will be reconsidered and altered.

The first of these is the totally unnecessary, and to our thinking preposterous proposal, to throw the first competition open to all architects without distinction of nationality; in other words to invite the whole world to compete. We doubt if there is another municipal council of a capital city in the world which would think it necessary thus to slight the architects of its own country by implying that they cannot be trusted to produce talent to adequately carry out such a building, and to add to their difficulties in a competition by inviting architects from other countries to compete with them. There might be more reason in putting up a national building of the first importance, such as a House of Parliament, to international competition (though we doubt if either the French or the Germans would do so); but for a municipal building, even of the first order, it is really absurd. It would have been quite reasonable and quite suitable if the competition had been confined to London architects, especially as it is almost certain that a London architect will in the end be the selected competitor, and the same object would thus be attained without tempting a number of persons all over the world to waste their time and energies in a work which, even on the small scale of the first competition, will involve a great deal of thought and trouble with hardly a chance of reward. And what do the Council expect to get by thus appealing to foreign architects? Do they think it in the least degree probable that any French, German, or Italian architect will understand the requirements for an English municipal building as an English architect would? And if not, what is the purpose of this international invitation? Does it arise simply from the ineradicable desire in the minds of English public bodies to see architects throwing away their time and energy and irritating their spirits by useless competition? What will they get from this invitation to foreigners? Probably some fine sketch ideas for buildings, which in plan will prove hopelessly unsuitable, accompanied by a number of impossible or eccentric designs. A waste of work, a waste of trouble to the assessors, all to no useful purpose, unless it be to amuse the County Councillors by a private exhibition; for we cannot find that even the slight reward of public exhibition, and whatever reputation that may bring them, is held out to the victims of the first competition. It is a foolish scheme, and directly at variance with the progressive opinion on this head, which tends more and more towards the conclusion that competitions, if the system is continued, should be limited in their effects as far as possible, so as to minimise to competitors the loss of time and the illusory nature of the chances held out to them.

The other objectionable feature of the competition is the selection of eight favoured architects who are to be invited by name, who are to be spared all the labour of the first competition, and are then to walk into the lists for the second competition, having had all this time to consider the problem quietly in advance. That is not playing the game. It is creating a favoured class in the competition, with whom the others are not competing on equal terms. Apparently this special list has been provided for fear some of the most eminent London architects should refuse to join in an open competition. In that case, why not make it a limited competition among the favoured eight? It is not in the least likely that the Council will get anything better out of their international competition than one or other of these eight would furnish them with. Let them do one thing or another, have an open competition limited to English architects, or a limited competition for eight (or twelve) selected architects. But to mix the two principles, open and limited competition, in this way, is utterly bad business.

RECENT ARCHITECTURAL DEVELOPMENTS IN JERUSALEM.—II.

WITHIN Jerusalem several important architectural developments have taken place within the past two or three years. One pleasing architectural monument has been added to the city in the shape of a little square church surmounted by five domes built on the outlines of an ancient mediæval church in the Via Dolorosa. The stone courses of the foundation seem to have been left *in situ* and the new church has been built upon them. This little building (Fig. 5) has a remarkable interest, not merely from an architectural but also a geological point of view. The central cupola is supported on four monoliths of red Bethlehem stone polished to the surface of ordinary marble. These monoliths are of a remarkable size—about 20 ft. high and 3 ft. diameter. The means of handling such stones are still primitive in Bethlehem, and one would think inadequate for such dimensions, but the work seems to have been accomplished without any great difficulty. The interior of the building presents in addition to these enormous blocks of marble-like stone a remarkable collection of polished limestones and alabasters, etc., from the quarries to the east of Bethlehem. The altars, floor, and other parts of the interior are decorated in a very tasteful and satisfactory manner with inlays of brilliantly-coloured stones—bright green, brown, red, and purple. The carved stonework is of a correct Byzantine style, and the proportions of the building, and its moulded details, etc., are most elegant and pleasing. Altogether this little building, which also looks as if it had cost a great deal of money and is worth it, is perhaps the most satisfactory monument of the Latin Church of modern days in Jerusalem. Herr Wenderlin, the author of this interesting monument, is a German architect now resident in the Holy Land.

In singular contrast with the little church just described, is another new building, also in the Via Dolorosa. This is a church built by the Armenian Catholics, and evidently an example of a large building carried out by the local masons without the intervention of an educated architect. As a consequence it displays the flimsy construction, and want of any natural taste in the selection of ornamental details, always observable in such cases. Years ago an argument was carried on as to the *raison d'être* of an archtect. It was maintained that true art could only be expected in the modern buildings if we returned to a (perhaps imaginary) condition of the Middle Ages, when the designing of detail is supposed to have been generally left to the individual caprice of the working mason. Advocates of such a theory should inspect the Armenian Catholic church or many other such buildings in Jerusalem—they will find plenty of examples of an original treatment of detail, but hardly a single pleasing or appropriate feature.

If the efforts of the native masons and builders are deplorable when exhibited on the new churches of the Latins or Protestants—that is to say, on buildings which may be supposed to have been erected with a certain European oversight—the attempts at "architecture" under the auspices of the Orthodox Greek church (Christians of the Ottoman Empire) are almost indescribable. At the present moment the ancient centre of Jerusalem is passing through that process rendered familiar to Europeans by the transformation of French and Italian towns, known as "Haussmannising," or by the expressive Italian term, "sventramento," or disembowelling. The "sventramento" of Jerusalem has commenced at the very door of the Holy Sepulchre church—that central object of interest and associations as wide and vast as the Christianity of the past 1900 years.

Whether the "sventramento" will penetrate within the venerable walls of the great monument of Christianity remains to be seen. At present the whole of the south side (with the exception of the little Mosque of Omar) of the ancient Rue des Palmiers, has been given over to a most extraordinary and ugly speculative building enterprise.*

The greater part of the area bounded on the north by the Rue des Palmiers and on the west by the old Rue du Patriarche, or "Christian-street," now belongs to the Greek Church, Community of the Holy Sepulchre—said to be one of the richest ecclesiastical institutions in the Levant. With a very natural desire to

Fig. 4.

Fig 6.

Fig. 5.

Fig. 7.

* Some years ago the eastern end of this site (covered by the ruins of S. Mary Major church, a building of the XIIth century), was presented to the German Protestants and a new church was erected on the site, with a tower and spire of about 100 ft. high. The church has little claim to be criticised as architecture—it looks like a modern German Lutheran church transplanted from some bath-resort on the Rhine—although it is credited by the general public with being a reproduction of the old Crusading church. It was opened by the present German Emperor during his tour in the Holy Land in 1898.

The German Protestant church is built on the N.E. corner of a large quadrangular area in the centre of the ancient city, known, in Moslem times, as the "Muristan."

make the best of a good opportunity, the Greek clergy have set about converting this eligible site into a network of bazaars to compete with, if not eventually take the place of, the dirty old covered market, which for so many centuries has been one of the features of Jerusalem.

But the modern Greek clergy have tastes in architecture which hardly appeal to the average European. The result produced in the middle of Jerusalem is a sort of nightmare phantasmagoria, which must be seen to be credited. The modern shops and arcades, entrance archways, etc., covered with a profusion of architectural details of various styles, misunderstood in their application, and meaningless under the circumstances, represent the bathos of Levantine want of taste and sentiment in things monumental. For monumental such work unfortunately is—it is executed in the hardest limestone, and will probably endure for many centuries to come. As a centre for this astounding piece of speculative building stands a curious fountain (needless to say, waterless) composed of pedestals, vases, masks, etc., probably quite unique of its kind. (See sketch, Fig. 7.)

One very interesting fragment of antiquity (hitherto only known to students) has been laid bare by the recent "sventramento." It seems to be the sole remaining souvenir of the great "Hospital" of S. John, which occupied the greater part of the area now appropriated for the new Greek Bazaars. This interesting relic is the substructure of the modern Greek church of the "Prodromos." It may always have been the sort of crypt which it now constitutes; in any case the massive masonry below ground and the few courses which are built up into the modern church are evidently of the Crusading Kingdom epoch. (Fig. 6.) With the exception of this fragment nothing now appears to survive above ground of the famous "hospices" of the Order of S. John. Some traces of ruined arches may still be discovered on the same side of Christian-street—traces which will ere long be swept away, as all the rest has been, when the rebuilding mania has reached that part of the town.

Adjoining the German Protestant church of the Redeemer, which occupies the site of S. Mary Major, are the remains of an ancient convent surrounding a square cloister to some extent preserved. This was the Benedictine convent attached to the original church, and has no connexion with the site of the "Hospital" (or Hospice, as it would now be called) of S. John, notwithstanding a current error on the subject at the present day.

Of the Mohammedans and the Jews, those two great sections of the Jerusalem community, there is little to record of a recent date. Since the visit of the German Emperor in 1898, when the great mosque of the Haram (site of the ancient temple) was cleaned up for his inspection, and rendered beautiful according to Moslem taste with a great deal of brown and white paint, nothing has been done to that wonderful monument of so many bygone associations. Persistent rumours are, however, afloat that within the near future some startling "restorations" are to take place in this important shrine of the Moslem world. Such proceedings may, however, be viewed with considerable anxiety outside the Moslem faith, and both Christians and Jews will be interested in any alterations to this most venerated of all sites in the world. Before any radical changes can be accomplished in the conditions of the sacred enclosure the archæologists, both Biblical and profane, will doubtless have an opportunity of discussing the matter.

At the present time a vast amount of energy seems developing in the Turkish Empire—of which these rumours of "restorations" in the "Mosque of Omar" are evidences. Jerusalem will before long be united by a railway with Mecca. French engineers are planning the new connecting link between Haifa and Ramleh on the Jerusalem-Jaffa line, and when this is completed the two greatest "Holy Cities" of the Mohammedan world will be united. The port for both these centres of pilgrimage seems to be indicated at Haifa. Here there are the perfect conditions for such an undertaking—the sea is not too deep for the construction of a breakwater enclosing a vast area, and the site is naturally protected by Mount Carmel from the dangerous south wind of the coast. From Haifa a railway in any direction passes through the most fertile of regions, and there is no question about its paying. There is also no question about the new "Haj" or pilgrim railway to Mecca paying—it is being constructed on pietistic principles, not as an investment of capital on the part of the public. It is perhaps the only railway in the world built out of the voluntary offerings and collections due to a purely religious motive. When once constructed it is supposed the current expenses of up-keep will be met by the traffic returns. At present this railway is in use to some extent as far as Kerak, a little to the south of Jerusalem on the other side of the Dead Sea.

No line of direct communication between Jerusalem and the new "Haj" railway can ever be made, on account of the engineering difficulties in crossing the immense depression of the Jordan Valley, and also on account of the uninhabited condition of the country. At some future time a line may perhaps be carried up the western side of the Jordan Valley, touching a few agricultural centres and joining on to the Damascus-Haifa railway near Tiberias.

WIDENING OF BLACKFRIARS BRIDGE.—The Bridge House Estates Committee of the Corporation have accepted Sir William Arrol & Co.'s tender of 203,000*l.* Eight firms of contractors submitted tenders in response to the twelve invitations issued by the Committee.

METROPOLITAN CATTLE AND MEAT MARKETS.—On December 19 Mr. A. L. Bower, Chairman of the Cattle Markets Committee of the Corporation of London, laid the foundation-stone of the public abattoirs, which will be erected by Messrs. Charles Dearing & Son, of Islington, from the plans and designs of Mr. Sydney Perks, Surveyor to the Corporation. An area of two acres in the market at Islington has been apportioned for the new buildings, which will supplant the existing slaughterhouses, and will embody all the most recent hygienic arrangements and improvements as adopted by the Committee after their visits of inspection to Manchester and Liverpool, and to Germany and France. The cost, 40,000*l.*, has been raised upon the private property of the Corporation and a draft upon the City purse. On the following day Mr. F. B. Harper, Chairman of the Central Markets Committee, laid the first stone of a new building at West Smithfield which will cost about 20,000*l.* and will be assigned to the live-poultry traffic.

NOTES.

Canterbury Cathedral.

IN a letter to the *Times*, Mr. Caröe cites Canterbury Cathedral as an instance of the irreparable injury that is being caused to historic buildings by the action of coal smoke. Although a small city with no large manufacturing establishments, Canterbury is, nevertheless, capable of producing smoke in sufficient volume to cause the most serious results. Following the expenditure of 9,000*l.* upon three faces of the Angel Tower, the scaffolding has been arranged so as to permit examination of the fourth face, with the result that Mr. Caröe finds it to be in a deplorable condition. The stone is rotten behind the crust of smoke, and the work of the ancient craftsman is gone for ever. Analysis proves that this condition is due entirely to coal smoke, an agent whose destructive qualities cannot be realised by those who produce it so freely, or by those who ought to prevent its production. We are quite in sympathy with Mr. Caröe in his appeal to the manufacturers and local authorities of Canterbury, but fear that even if the discharge from factory chimneys were rendered smokeless, there would still be something to fear from the invisible products of combustion as well as from the smoke emitted by domestic chimneys-pots, which, taken collectively, are not less harmful than isolated flues of more monumental proportions.

Waterworks and Land Subsidence.

THE case of Fletcher *v.* Mayor, etc., of Birkenhead, commented upon by us December 30, 1905, has been carried to the Court of Appeal, where the decision of the Court below was affirmed on all points. The case is a very important one. The defendants under an Act of Parliament had acquired certain land and had erected certain works in connexion with their waterworks undertaking upon it. The plaintiff owned a dwelling-house and land adjoining, and the subsoil under this land was partially wet running silt, so that the pumping operations carried on by the defendants withdrew this silt and caused the land to subside. The defendants argued that this damage being incidental to the working of the undertaking as distinguished from its construction gave the plaintiff no right to compensation, contending that the case was similar to railway companies under the Railway Clauses Act, in the case of those undertakings it having been decided by the House of Lords that compensation was not recoverable for vibration caused in the working of the railway. The Court of Appeal analysed the various Statutes, and came to the conclusion—(1) That under the defendants' private Act the pumping which caused the damage was part of the construction of the works contemplated by the Statute; (2) even if this were not so the Waterworks Clauses Act, 1847, differed from the Railway Clauses Act, 1845, in that the former Act in sect. 6 gave compensation for damage caused by the maintenance and user of the works, as well as by their construction; and (3) that sect. 12 of the Waterworks Clauses Act, 1847, also applied to water taken by pumping to maintain supply. The plaintiff, therefore

succeeded, but the question is one of such importance that it seems likely that the case will be carried further to the House of Lords.

Sanitary State of Non-Provided Schools.

IN 1905, after a careful inspection, the London County Council condemned 267 non-provided school buildings as unfit for use. This was a striking comment on the manner in which the managers of the so-called voluntary schools had attended to the structural condition of the buildings under their charge. It was even more of a condemnation of the inefficient system of Government inspection. Since this Report was made to the Council 58 schools have been put into a proper structural state by the managers, but the 209 remaining schools are still untouched. The Bishops of London and Southwark now appeal for 50,000*l.* for the purpose of bringing the buildings up to the required structural and sanitary standard. We are much inclined to think that from an educational and hygienic point of view it would be preferable for the scholars in these schools to be absorbed in provided schools, and for such new schools as may be necessary to be built. In the large towns it is essential that the bodies of the scholars as well as their minds should be considered, and we doubt if this tinkering with old buildings can make them really satisfactory or whether those who study in them do so under the best conditions. From an educational point of view we should like to see every school in London a non-provided school—in other works, one uniform educational system which would put an end to these begging letters from the Bishops in respect of what is really a national matter.

Temporary Wooden Stands.

A CASE was heard last week at the Guildhall in which the question was raised whether a District Surveyor of the County Council was entitled to inspect, and charge a fee for inspecting, a temporary structure, a stand, erected in the offices of the London and India Dock Company in Leadenhall-street, to enable a small party of spectators to view the Lord Mayor's Show. The Alderman dismissed the summons, but consented to state a case. This question came before the Courts at the time of the funeral of Queen Victoria, and in Westminster Corporation *v.* London County Council it was decided that the powers of licensing wooden structures conferred by sect. 84 of the London Building Act, 1894, on the London County Council, were transferred by the London Government Act, 1899, to the various Borough Councils. Sect. 84 has, however, no application in the City. In the case of Mayor of Westminster *v.* Watson it was held that these stands were structures or works under sect. 145 of the London Building Act, 1894, of which the District Surveyors were entitled to have notice, and that where there was a *bonâ fide* duty on the District Surveyors to inspect the structure they were entitled to fees, but that the London County Council should fix a lower scale of fees when the duties were thus divided. The point would, therefore, seem to be—Was there a necessity for inspection? From the short report of the case it is not clear whether these cases were brought to the notice of the Alderman, or whether he decided the case on that ground.

Further Subsidence of Buildings in Tunis.

IN our "Note" of October 20 on "The Importance of Good Foundations" we mentioned the remarkable subsidence of a concrete-steel granary in Tunis. This building is one of three erected on the same site, and we now learn that after the first had been safely restored to a vertical position, the middle block began to settle at one side until the cornice overhung the base by about 20 in., a fault that was remedied without much trouble. The building in question being square in plan, and situated between the adjoining structures, was naturally less liable to disturbance than the other two, partly because of its shape and partly owing to compression of the ground on two sides. A few weeks later, however, block No. 3 began to develop a double inclination, which continued until the cornice of the outer side overhung the base by 18 ft., and one corner had settled to a depth of nearly 5 ft. lower than the other. Notwithstanding the onerous nature of the task, this building was restored to the perpendicular within twenty days. We do not know the exact height of the buildings, but some idea of the measurement can be gathered from the statement that all of them have six floors in all, commencing at ground level. No injury of any kind appears to have been done to the concrete-steel construction by the subsidence and restoration of the buildings, a point that is made clear in some measure by the fact that the window-glass was not broken. Levelling operations were effected by loading the upheaved side of each building, and assisted by trenches dug along the foundations, permitting the soft subsoil to flow upward under the pressure. The fact that these huge buildings were displaced and restored *en masse* without injury is a wonderful testimony to the strength and rigidity of properly-designed concrete-steel structures, although showing that the designer had not adequately considered the question of foundations.

Substitutes for Copper.

THE continued rise in the price of copper during the last few years has had the effect of hindering the expansion of the electrical industry in various directions. The cost of manufacturing cables and fittings has been considerably reduced; but the rise in the cost of materials more than counterbalances this saving, and many manufacturers have recently issued notices stating that the prices of certain articles in their catalogues have been advanced 20 or 30 per cent. It is not surprising, therefore, that the merits of all the possible substitutes for copper are being carefully considered by electricians. The difficulties in suitably soldering aluminium wire have not yet been completely overcome, although it is extensively used for transmitting electric power at high pressures by overhead wires. Extensive practical experiments have recently been carried out by Mr. Betts in America on the use of sodium as a conductor. The results show that in some cases it is much more economical than copper. As sodium reacts violently with water it is protected by an iron tube. The tube is closed at one end by a cast-iron cap and heated. Molten sodium is then poured into it from an iron kettle. Contact is made between adjacent conductors by graphite ends with short copper junction pieces. Of all the common metals sodium is the best electrical conductor, and it is manufactured in large quantities at electro-chemical factories near Niagara Falls by the Castner process. The cost of manufacture is about 6d. per lb., while the cost of salt is slight and chlorine is a by-product. As more economical processes of making sodium have recently been invented Mr. Betts anticipates that the price will soon be 4d. or 5d. per lb., and hence it would be very much cheaper than copper. It has, however, several limitations; for instance, it can only be used for overhead transmission, and it must not be brought near a building. If one of the iron pipes burst the sodium would probably burn quietly, but any attempt made to put the fire out by water would be most dangerous.

Producing Oxygen.

IT has long been known that oxygen in the gaseous form can be obtained by allowing water to come in contact with sodium peroxide or potassium peroxide, but it is only in recent years that this simple method of generating oxygen has become extensively used. The high cost of these peroxides has prohibited their use on a large scale. The value of oxygen for inhalation is well known, and in those places where oxygen may be suddenly required, and where compressed oxygen cannot be obtained, sodium peroxide may be found very useful. Under the name "oxylithe" alkali peroxides are sold in the form of cakes in suitable boxes. When oxygen is required, a pin-hole is made in the box, and the box is immersed in water. The gas then comes off rapidly, and may be collected in a rubber bag or other suitable receiver. But the price of a box of oxylithe is half-a-crown, and only one cubic foot of oxygen is obtained from each box. The gas prepared in this way is, therefore, too expensive for use on a large scale. In saving life the cost would hardly be considered. For industrial purposes, such as welding by means of the oxy-acetylene blowpipe, large quantities of oxygen are required, and a cheaper material for producing oxygen has to be used. A compound called "epurite," which costs only twopence per pound, is sometimes used, and it is stated that one pound of this material will yield about 1¼ cubic feet of oxygen. We do not know of what "epurite" is composed. All we are told is that it is a deliquescent powder "containing oxygen in a latent state in a form susceptible of easy liberation on contact with water," but apparently oxygen obtained from "epurite" is as cheap as compressed oxygen.

Electric Signalling on Railways.

THE paper read last week by Mr. H. G. Brown to the Institution of Electrical Engineers, on "The Track Circuit as Installed on Steam Railways," gives a clear account of a practical application

of electricity which is little known even to electrical engineers. In electric traction, electrical methods can readily be employed for signalling when a train is on a section of the track, but it is not obvious that similar methods can be economically employed on steam railways. The principle of the method described by Mr. Brown depends on the fact that the electrical resistance of the ballast and sleepers between two lines of rails is appreciable. Consecutive rails are connected by copper bonds, as in electric traction. The length of the "track circuit" is usually 1,000 ft. When there is no vehicle on this section, a constant difference of electrical pressure is maintained between the two rails by means of accumulators having resistance in series with them. When a train or a waggon is on the section the two rails are practically short-circuited by the wheels and axles, and so the electrical pressure between them becomes negligibly small. In this case the windings of a magnetic relay which are connected between the rails cease to be excited, the effect being that the signal is brought to danger. Any failure on the part of the batteries or in the insulation between the rails will also bring the signal to danger, the method, therefore, fulfils this first essential condition of any system of signalling. The Daniell cells formerly employed were found untrustworthy, as their internal resistance was too variable. The first cost of accumulators is greater than primary batteries, but they are cheaper to maintain. The electrolyte also has a much lower freezing point than the zinc and copper sulphate solutions used in the cells, and hence there is no necessity for a deep battery well to protect them from the cold. Although it is difficult to see how this system can fail with heavy trains, yet it is possible to imagine that if the rails were in a bad condition a light waggon would not have a sufficiently low resistance to short-circuit them effectively. As such a waggon might possibly be left on the track during shunting operations, a fuller discussion of this case seems necessary.

Technical Education.

ON Friday last week the distribution of certificates, prizes, and medals took place at two institutions where special importance is attached to the practical side of technical education. The first of these is the Crystal Palace School of Practical Engineering, devoted to the training of civil, mechanical, and electrical engineers in such a way that at the end of his two years' course the student has acquired a fair knowledge of the three great branches of his future profession, and is ready to enter upon that extended course of study which should continue throughout his subsequent career. In addressing the students upon the occasion to which we refer, Lord Brassey alluded to the long list of ex-students who had taken prominent positions as a testimony to the value of the school—a tribute we are able to corroborate from personal knowledge of the thoroughly practical character of the training there imparted. The second institution is the Trades Training Schools, founded by the Carpenters' Company and other City Guilds—an establishment where, as Sir William White remarked, the students are engaged in attempting to perfect themselves in those trades and crafts in which they are daily occupied. While mere book learning invariably tends to vanish if not applicable to the daily life of its possessor, the assimilation of theory and practice, which is the great object of the two training schools here mentioned, is distinctly calculated to create a lasting impression on the minds of students, and to encourage in them the habit of looking for the confirmation of theoretical knowledge in the course of practical work.

War Office Buildings, Pall Mall.

ON December 18-19 the executive staff vacated the offices on the south side of Pall Mall, and the statue of Lord Herbert of Lea has been removed to within the court-yard of the War Office in Whitehall, where it faces the middle arch of the gateway in Horse Guards-avenue. Some of the chimney-pieces and other fittings have been taken to the new building in Whitehall. The central portion of the offices in Pall Mall was either a rebuilding or an extensive alteration by William Atkinson, before 1839, for the Ordnance and Transport Departments, of the Albion Hotel, a "subscription house," the successor apparently of the Union Club established in 1801. The Union Club premises were formerly known as Cumberland House, erected after designs attributed to Matthew Brettingham for Edward, Duke of York, and afterwards occupied by Henry, Duke of Cumberland, brothers of King George III. The finishing and fitting up of the house cost the Duke of Cumberland nearly 70,000*l.*; the house was converted (in December, 1801) after his death for purposes of the Union Club. Of the adjoining official buildings the house known as Buckingham House, on the east side, was built in 1794 by Sir John Soane for the Marquis of Buckingham; on the west side of the fore-court is the block erected by Sir James Pennethorne, and illustrated in the *Builder* of August 16, 1851; next west to that are the middle portion and the west wing of (old) Schomberg House built for the third and last Duke of Schomberg in the later years of the XVIIth century; Peter Berchett painted the principal staircase. (Old) Schomberg House was the home of Gainsborough, who occupied the west wing during the last eleven years of his life; his contemporary, John Astley, artist, occupying the middle portion, over the portico of which he set up a bas-relief of "Painting." To Astley succeeded Cosway, R.A., and after Cosway's death the Polygraphic Club.

Blackfriars Bridge.

IT is amusing in one aspect, though saddening in another, to see the daily newspapers speaking with solemn interest of the careful manner in which the widening of Blackfriars Bridge is to be carried out without spoiling the "design." The *Daily Telegraph* of the 19th, for instance, tells us how "the handsome outer steel girders and parapets, and the fine red granite decorative pillars on the supporting piers, will be used unaltered to form the new west side," so that the Londoner will notice "no alteration in this fine structure" beyond the widening of the roadway. The bridge has been condemned by every artist since it was built, as one of the most vulgar and tawdry things in London; but no such criticism ever reaches the deaf ears of the typical "daily" journalist; for him it is still a "fine structure," and he would probably be utterly bewildered to know why anyone could object to it. Architects and art-critics may preach for half a century on absurdities of design like this bridge, but such structures never reach the ear of the daily paper and its public. The remark as to the "decorative pillars" is too delightful. It must be admitted that they are of no use; but we fear that does not make them decorative. One would have hoped that the necessity for widening the bridge might have been made the occasion for building a new and less objectionable structure; but there are many people who would have thought this a destruction of one of the architectural adornments of London!

THE STRUCTURAL DESIGN OF ENGINEERING FACTORIES.*

THE system of construction of engineering workshops has changed considerably during recent years in consequence of the rapid developments of engineering practice and the necessity for more rapid and economical production demanding improvement in plant and operations. The erection of new buildings and the reconstruction of existing ones has been necessary to meet these altered conditions.

Formerly, engineering factories were constructed of heavy masonry or brick walls of great thickness suitable to carry steam travelling cranes, and bound together with heavy timber roof trusses. The lighting was usually provided by windows in the side and end walls, and sometimes from narrow roof lights. Little attention was given to ventilation and heating. The shops were dull and gloomy; artificial light, usually gas or oil, was often required to enable the workmen to attend to their duties. Considerations with regard to the expensive and substantial character of the buildings were not favourable to economical reconstruction or modification to suit any proposed re-arrangement of machinery and plant.

Modern workshops consist of wider buildings of greater height, with plenty of roof light, efficient ventilation and artificial heating. Jib cranes, mono cranes, and high-speed electric travelling cranes are adopted to enable the work in progress to be expeditiously handled.

As the weights and speeds of travelling cranes increased, it became necessary to construct the walls with heavy piers or buttresses (as shown on the right side of the transverse section of the building in Plate 1) to carry the longitudinal gantry girders, which were usually made of trussed timbers. These piers enabled the heavy local loads from the cranes and roof to be provided for on suitable foundations at definite fixed points, but they occupied valuable floor space. Cast iron columns of H section were then introduced in place of masonry piers to carry the crane and roof loads and to strengthen the walls. Later on, the columns and gantry girders were constructed of wrought iron or steel. The adoption of wrought iron enabled a wider spacing of columns and a more economical use of the floor space, as well as a less costly construction. As the heavy local loads could be carried by the reinforcing material, the heavy walls became unnecessary, and gradually the modern steel-framed building was evolved, capable of supporting all the loads, the outer walls being required only for protection against the weather. The brick or masonry walls of the full height were dispensed with. The outer side covering was formed of corrugated iron or weather boarding, and the roof covering consisted of tiles,

*A paper read before a joint meeting of the Junior Institution of Engineers and the Architectural Association Discussion Section, December 3, by Mr. Adam Hunter, A.M.Inst.C.E.

slates, corrugated iron, or glass. Light steel roof trusses replaced the timber trusses, and with the columns formed a rigid framework to resist the structural and wind loads as well as those from the cranes and shafting.

A later development is the substitution of 9 in. brick filling in steel framework for the outer walls. Reinforced concrete is also finding a legitimate use for filling in the structural steel framework.

The structural design alone of engineering factories will be dealt with in this paper. The planning and disposition of machinery and the necessary crane equipment is outside its scope. These are matters for experts who have a thorough knowledge of the particular trades and of their requirements in the processes of manufacture. These requirements differ in the same trades according to the volume of work to be carried on and possible developments. Great assistance in the consideration of the plans can, however, be given by the structural engineer to the manufacturer when he is able to formulate his requirements. The use to which the buildings are to be put, the position of the machinery, the possible extension and growth of the business, and the size and shape of the site will, generally, determine the dimensions. As a general rule, the buildings are of one storey, but where the ground is expensive or limited in area it may be necessary to build them in two or more storeys.

Material.—The principal material used in the framework is mild steel made by the open hearth acid process, and having an ultimate tensile strength of 28 to 32 tons per square inch of section, and an elongation of at least 20 per cent. in a length of 8 in. Basic steel of a lower tensile strength should not be used unless a substantial increase is made in the sectional areas of the different members. Cast iron, although apparently an excellent material for compressive stresses, is entirely discarded, except for unimportant details. Owing to the low price of steel, it is possible to make a steel column of equivalent strength cheaper than one in cast iron. The impossibility of obtaining long columns without joints, the hidden flaws and imperfections, the liability of breakage in transit with its consequent loss of valuable time in replacing the castings, rule cast iron out of account as a reliable structural material. It must not be forgotten also that columns used in workshop buildings are subjected to severe bending stresses due to temperature, and from the racking forces and shocks from jib and travelling cranes. Cast iron is unsuitable for stresses of this character.

As an example of the stresses due to temperature to which the columns are subjected, a building will be considered having the moderate, but quite common, length of 300 feet. No provision is made in a workshop building for contraction or expansion either longitudinally or transversely. All movements due to changes of temperature are allowed to bend the columns, and as they are secured to massive foundations they will deflect as cantilevers from their bases. The range of temperature in this country will cause a difference in length of about 1¼ in. in a building 300 ft. long, deflecting the extreme end columns ⅝ in. If the length of the column is taken at 30 ft. and the columns are assumed to be securely bolted to the gantry girders and to the foundations, the tensile stresses in the columns due to temperature may be as high as 3½ tons per square inch, or about the elastic limit of the cast iron. If the columns were set and fixed at a mean temperature the maximum tensile stresses would be half this amount. With shorter columns the stresses would be proportionately greater, as they vary inversely as the square of the length.

Many difficult problems arise in the design of workshop buildings, requiring not only scientific but practical knowledge of the manufacture and erection of structural work. Special study and experience is essential to enable a satisfactory and economical design to be prepared. Special rolled sections should be avoided, for although they may be listed by manufacturers they are not readily obtained. As few different sections should be used as possible so as to obtain quick delivery of material from the rolling mills. It is better to vary the thickness of a section to obtain increased area than to use one of different scantlings. Although standard sections may be used, it does not follow that they can be obtained quickly or even obtained at all. There are certain sections in common use and continually being rolled. These should be used, as the mills are able to supply them without delay.

Forces due to Cranes.—On account of the adoption of high-speed electric travelling cranes fitted with magnetic brakes, it is important to provide for the horizontal forces produced by the sudden application of the brakes to the rapidly moving crane, and for the forces due to acceleration and retardation of the speeds. The horizontal braking force cannot be greater than the sliding friction between the wheels and the rail, assuming the crane to be suddenly stopped when travelling at its greatest speed, and the wheels to skid on the rails. It attains its maximum value at or near the point of rest. The maximum value of this force may be assumed to be one-eighth of the load on the wheels and to be divided between the two lines of rails in proportion to the load carried by each. The following table gives the coefficients for sliding friction between steel tyres on steel rails, and is compiled from experiments by Westinghouse and Galton with railway trains :—

TABLE I.*

Speed in miles per hour	10	15	25	38	45	50
Speed in feet per minute	880	1320	2200	3344	3960	4400
Coefficient of friction	0·110	0·087	0·080	0·051	0·047	0·040

* Goodman's Mechanics Applied to Engineering.

In designing railway bridges it is usual to assume that the maximum horizontal force due to the sudden application of continuous brakes to the train is about 400 lb. per ton of weight of the rails, or a coefficient of 0·18. It is certain that the track on a gantry girder in a workshop is in a much better condition through the method of supporting it than an ordinary railway track, and would consequently have a lower coefficient of friction. The horizontal forces from the cross travel of the crab may be taken as one-half of the preceding, on account of the lower speed at which it works and slower acting brakes. It is not unusual to drag weights along and across the floor of the workshop by means of the travelling cranes. Provision should be made in the design to resist these forces. As sliding surfaces or rollers are usually provided under the pieces being moved, the horizontal component of the dragging force may be taken at one-tenth of the lifting capacity of the crane.

Jib cranes and mono cranes are frequently fixed to the main columns. Adequate provision must be made both in increased scantlings and design of the details of the framework to resist the forces due to them. No weights can be given for these cranes, as the working loads and radii vary so much.

Main line shafting may be secured to the roof trusses where there are no travelling cranes. Where there are travelling cranes the shafting may be supported from the longitudinal gantry girders and main columns. The additional load in hundred-weights per lineal foot from the weight of the shafting, pulleys, and pull of belting may be taken at from one-eighth to one-tenth D^2 where D is the diameter of the shaft in inches.

Wind Pressure.—The external loads to which a building is subjected are principally those due to snow and wind. In this country it is seldom that a greater fall of snow at one time than 12 in. occurs, and even this is rare. Twelve inches of newly-fallen snow will weigh about 5 lb. per square foot. This is an ample provision, as it is usually taken in conjunction with a high wind pressure, although it is doubtful if 12 in. of frozen snow would lie long undiminished, even under a moderate wind.

A great variety of ill-informed opinions exist with regard to the maximum wind pressure, against which it is necessary to provide. The Board of Trade specifies a wind pressure of 56 lb. per square foot for loaded railway bridges, but in the case of road bridges and buildings no regulations exist other than local building laws or requirements, and these are often based on an imperfect knowledge of this subject. The pressure of 56 lb. per square foot was fixed by the Royal Commission appointed to investigate the cause of the failure of the Tay Bridge in 1879. Previous to this date the effect of wind pressures was seldom considered in designing a structure, and when considered the amount varied considerably, depending much upon the timidity or temerity of the engineer. Since the fall of the Tay Bridge more knowledge has been gained with regard to wind pressures. During the construction of the Forth Bridge careful records of wind pressures were kept.†

The highest pressure of wind recorded at Greenwich between the years 1849 and 1869 was 41lb. per square foot, and many instances occur in the Greenwich records of pressures of 30 lb. and 40 lb. These wind pressures were probably from velocity records on the rotary cup anemometer, and reduced to pressures by the formula, $p = 0{\cdot}005\ V^2$, published by Smeaton in 1759, and regarded as an authority until recent years. Later investigations have shown that the results given by this formula are too high. Various experimenters have assigned different values to the constant. From careful experiments made at the National Physical Laboratory, this constant has been given at 0·0027 (*Proceedings* of the Institute of Civil Engineers, Vol. CLVI.). From these same experiments it was shown that the negative pressure on the leeward side of a triangular roof may be greater than the positive pressure on the windward side of the roof slope, and the negative pressure on the leeward side of the building may be as great as one-third of the positive pressure on the windward side.

The greatest wind pressure to which a building is subjected is that from a horizontal wind. The uplifting force of the wind need not be considered except for open sheds. The maximum pressure is not uniform from the ground level to the roof, but is greatest at the centre. It is diminished near the ground level by the frictional resistances of the ground, and at the eaves from the eddies formed by the air escaping over the roof. The change in direction of the air when striking a flat surface such as the side of a building will form a cushion to diminish the effects of impulse and shocks from local gusts. The impulse of gusts must also be diminished by the time taken to overcome the inertia of the building.

The following table from experiments by Stevenson shows the varying velocities of wind at different levels above the ground in an open space, and forms a guide to the varying pressures at these levels :—

TABLE III.

Feet above ground.	5	9	15	25	52
Velocities in miles per hour.	4	6	6	6·5	7·5
	7	17	18	21	25
	13	23	25	30	32
	19	28	31	35	40
	26	32	34	37	43
Average.....	13·8	21·2	22·8	25·9	29·1

In the experiments on roof models at the National Physical Laboratory the varying pressure on the vertical windward side was shown to vary in the following relative ratios for a building with a roof slope of 30 deg. and an air velocity of ten miles per hour :—

At ground level	179
At centre of height	182
At eaves level	168

In American practice the wind pressure on factory buildings is usually taken at from 20 lb. to 30 lb. per square foot for buildings over 25 ft. in height.

With regard to wind pressure in factory design, it will be found sufficient if the buildings are designed to resist an average steady wind pressure of 30 lb. per square foot, this pressure being taken in estimating the wind load on any member of the frame.

† The table of these records was given with a very short résumé of the paper in our issue of December 15 (page 692).

work supporting an area of 300 sq. ft. and under, and would be diminished by 1 lb. per square foot for every 100 sq. ft. in excess of this amount to a minimum of 20 lb. per square foot, and that the building should resist overturning with a steady pressure of 50 lb. per square foot. Higher pressures than these will only occur at rare intervals, and under such pressures the stress may safely be permitted to approach the elastic limit of the steel.

The subject of wind pressure has been treated at some length. It is a question constantly arising as to what pressure should be allowed in designing a structure, and it is hoped that sufficient information has been given to enable satisfactory decisions to be made that will not involve an extravagant use of material.

General Principles of Design.—In general, the design of a workshop building must be such as will resist without appreciable distortion the whole of the external and internal forces to which it may be subjected. Unless this is so, the travelling cranes will bind; and if shafting is used, it will get out of line and run with the consequent frictional losses. An important matter to bear in mind is that rigidity and stiffness are of as great importance as strength, and that the design as a whole should contribute to these factors in the simplest and most economical manner. In the design of details attention should be given to the large secondary stresses from the unavoidable eccentricity of connexions and from unequal loading. In buildings of a permanent character the possible developments of the business should be given full consideration, as a small increase of section will yield an increase of strength out of proportion to the extra cost. Recently two buildings which were designed for 10-ton travellers were strengthened to carry a 30-ton traveller in the one case and a 40-ton in the other. The extra cost of providing for these loads when the buildings were designed about six years ago would have been small compared to the cost of strengthening them afterwards.

A workshop building consists of main columns of suitable section to support the loads from the longitudinal gantry girders and roof trusses, and to form, together with the roof trusses, a frame to carry the structural and crane loads and to resist the external forces. Diagonal bracing is placed in a vertical plane between the main columns to resist the horizontal forces due to the braking of the travelling cranes and from the action of jib cranes and end wind pressure. Diagonal bracing in a horizontal plane is fixed between the tops of the columns at the roof tie level to assist in distributing local forces from cranes and side wind, and to line up and square the building. To prevent the roof trusses being overturned by end wind on the gables the pair of roof trusses at each end is braced between the rafters, and also in a vertical plane on the centre line. The main columns should always be carried up to the underside of the roof trusses, and the roof girders fixed between the columns, and not on top of them. The roof trusses are further secured to the top of the columns with triangular brackets or rakers at the junction. This construction is simple to manufacture, easy in erection, and rigid in construction.

The actual working conditions should be considered in fixing the likely combinations of loads. Often there are two or more travelling cranes in one bay, and two may be brought together to lift a single load by means of a lifting beam, or a sling may be passed round the load and attached to the lifting hook of each crane. It is possible that two cranes travelling in the same direction may be braked about the same time. Ample provision will be made for the braking forces if they are assumed at 50 per cent. of the total possible effort of all the cranes. The same proportion will be sufficient for the jib cranes. The maximum side wind pressure need not be taken with the full crane loads. Such a combination rarely occurs, and when it does there should be an ample margin of safety in the structure to provide for it.

Having outlined the general principles of the design, attention will now be given to some of the constructional details.

Foundations.—No definite rules can be laid down as to the class of foundation to adopt, as the conditions of each case vary more or less from that of any other, and depend to some extent on the mechanical appliances and materials at hand. The importance of a good foundation cannot be overestimated, for upon the efficiency of the foundation depends to a large extent the stability of the structure.

It must be remembered that it is that part which, when once completed, is covered up and cannot be attended to afterwards without great risk and expense.

The bottom of the foundation should be laid in all cases deep enough to be beyond the influence of frost or drought. In this country a depth of 3 ft. will be sufficient for soils of a porous nature, and about 4 ft. in clayey soils. In countries where there are greater extremes of temperature it is necessary to go deeper. These depths are necessarily approximate, as the stratification of the ground and the loads to be carried will determine the depth to which it is necessary to go. A foundation cannot be properly and economically proportioned without a correct knowledge of the soil and underlying strata. If existing structures, such as wells or railway cuttings, do not afford this information, it will be necessary to sink trial pits or borings on or near the site. The bearing capacity of the soil may be ascertained by loading trial cylinders. A sufficient precaution in ordinary cases is to try the bottom of the excavation with iron rods, or to bore holes for a few feet below the proposed bottom to find if the soil remains firm to a sufficient depth.

The simplest and cheapest form of foundation is a rectangular block of concrete of suitable dimensions to distribute the load. The columns are fixed to the concrete by long bolts having a large washer at the bottom. The bolts should have sufficient play in the concrete to allow of some adjustment in fixing the columns. Square-tapered holes, formed by wooden boxes, are left in the concrete. The size of the hole at the top should be sufficient to allow the washer to pass through, and should be tapered about 1 in 24. After the concrete is set the boxes are removed and the bolts are inserted. The holes are grouted up with cement when the columns are plumbed and fixed in position. . . . Where heavy loads are to be carried, a grillage may be used instead of a bedstone. The depth of the excavations and quantity of concrete is reduced by this means. A piled foundation may be used in conjunction with the grillages.

Main Columns.—A single rolled beam may be used, or a web-plate with four angles, and these may be strengthened by the addition of flange plates. Two or more joists may be used with flange plates, or connected by lattice bars or batten plates. Light gantry girders may be supported on brackets riveted to the columns. Where heavy travelling cranes are carried by the gantry girders, the loads are transmitted to the ground in a more efficient and economical manner by designing the column so that the section is brought directly under the girders.

Gantry Girders.—The gantry girders must be designed to resist not only the vertical loads imposed on them by the travelling cranes, but also the horizontal bending stresses due to the braking of the cranes in cross travel, and from dragging weights across the floor. A top flange of greater width and stiffness is required than for an ordinary girder of the same span. The rolled beam is a cheap and economical girder for light loads. Where great rigidity and stiffness are required the box girder is suitable. This section is designed so as to be accessible for machine riveting. The top flange is formed with inner as well as outer angles, to stiffen the flange plate against dishing under the rail, due to the heavy concentrated wheel loads. Box girders are open to the objection which applies to all closed sections, that the interior is not accessible for inspection and painting after completion, but as the interior is practically sealed it is unlikely that any serious corrosion will take place. In any old box girders which the author has seen opened up there was far less corrosion on the interior than on the exterior surfaces. Lattice gantry girders are in use, and compare favourably with plate girders in economy of material and stiffness. The rails in general use are bridge rails riveted to the top flange of the girders. Flat bars are sometimes used for the rails for heavy cranes.

Roof Girders.—The cross sections suitable for roof girders depend somewhat on the span and loads to be carried. Rolled beams, plate, and lattice girders are used. Plate and lattice girders are, of course, suitable for all spans and conditions of loading. The lattice girders are light in appearance, and economical for spans over 30 ft. They can be made deeper than plate girders without waste of material, and act to some extent as longitudinal bracing. Rakers are sometimes added, and the vertical diagonal bracing between the main columns dispensed with.

The trusses should be designed with all purlins resting directly over an apex, so that the vertical intersecting line of the load comes through the intersection of the gravity lines of the truss. If this cannot conveniently be done the rafters should be designed to resist the consequent bending as well as the direct stresses. The main ties are usually horizontal, to obtain a more economical and rigid construction. There is generally no satisfactory reason in buildings of this class for giving the roof tie a large camber, as is often done. Through the various racking stresses to which a roof truss in these buildings is subjected, the horizontal member is often in compression, and the section should be such as will resist this stress in the most direct and suitable manner. The horizontal bracing under the roof trusses is bolted to the tie where they cross, and this connexion is simplified by using a horizontal lower member for the roof trusses.

Where shafting or runways for cranes are supported from the trusses, the lower member is made of channel bars, so that the shafting or runways may be fixed at any convenient point, and also to better withstand the shocks from the starting and stopping of machines. Provision is sometimes made so that tackle may be attached to the trusses for lifting weights, such as the crabs of the travelling cranes and other loads.

In rolling mill roofs it is sometimes desirable that the rolls, weighing as much as 8 to 10 tons each, may be lifted from them. Light travelling cranes may be carried from the roof trusses.

The connexion of the roof trusses to the columns is often a weak point in the construction, and every precaution should be taken to make it as stiff and rigid as possible.

In foundries and smithies where there are corrosive gases, sufficient allowance should be made for corrosion by increasing the section over that required for strength.

The sections of material adopted in roof trusses or girders are generally angle bars, whether the member is in tension or compression, and that all joints and connexions are riveted. In the best practice it is considered desirable that flat bars and rods and adjustable members should be avoided. An angle bar makes as good a tie as a flat bar or rod. It permits of simple riveted connexions, and forms a stiff and rigid member. It is the cheapest section rolled in steel. Where an angle bar is used as a tie and connected by one leg, allowance is made for the eccentricity of the connexion. A simple rule is to take the effective area as that of the riveted leg added to one-half of the free leg. Where the angles are connected by cleats so as to be riveted in both legs, the full sectional area may be taken.

It is quite the usual practice for the whole of the roof covering to be of glass. Putty glazing is extensively used and gives entire satisfaction. It is cheap, and, when properly done, has a long life. Plastic putty, made with a proportion of tallow in the whiting, is sometimes employed. Different forms of patent glazing are also used. Those with the lead covered bars, such as Mellowes well-known type are the most durable. Patent glazing is more expensive than putty glazing, but the maintenance is practically nil, and the life is unlimited. The glass used is rough cast plate, ¼ in. in thickness, in widths of from 18 in. to 24 in., and in lengths of from 70 in. to 80 in.

Very little trouble on account of vibration and temperature movements is experienced with glass roofs.

No inconvenience is found to arise with all-glass roofs due to the workshops getting unduly warm in the summer time or from the

winter cold. With the lofty roofs in use and ample roof ventilation, no complaints are made of undue warmth. The heating system of steam pipes provides against the winter temperature. A precaution usually taken to keep the workshops cool is to whitewash the glass in the early summer. By the end of the autumn the rains have generally cleaned it off, and what little remains is easily removed with a little washing soda and water at the annual inspection and cleansing of the roofs. The benefit of a good roof light is apparent at once to any one who compares it with the old style of narrow roof lights and side windows. The workmen can attend better to the work in hand, and there is increased efficiency and a saving in the cost of artificial lighting.

Sliding gates are usually placed outside the building, and are made of wood or corrugated iron on a steel framework. They should be hung from the top on friction rollers to permit of easy opening.

Ventilators.—Fixed or movable louvres may be used with the sheeted ventilator. In foundries and smithies large open ventilators are required to permit of the escape of smoke and gases. In machine and erecting shops the small ventilators give ample ventilation. A curved batfle plate should always be fixed at the bottom of the ventilator to keep out driving rain and snow.

Floors.—Types of oors suitable for galleries and ground floors are shown in Plate 15. Canadian rock maple is sometimes used for machine shop floors. It is hard and durable. Heavy machine castings may be dragged on it with comparative ease and without splintering the floor. Wood-block flooring, similar to street paving, is in common use for machine and erecting shops. In smithies and boiler shops, furnace ashes, well rolled, is the usual type of floor.

Painting.—The steelwork is painted before leaving the manufacturer's yard, and receives at least one coat of paint after it is erected and the building covered in. Red lead is best for the priming coat and oxide paint for the finishing coat. In German specifications it is required that the steelwork should first receive a coat of boiled linseed oil, in order that the red lead coating should be more coherent with the steel. Steelwork that has to come in contact with brickwork or concrete should not be painted, but should receive a wash of cement as the brickwork or concrete work proceeds. Galvanised corrugated sheeting should not be painted until it has been exposed for some time to the rain and weather. Some traces of pickling acid may have been left on the sheets, and this exposure clears all remains of it. The steelwork which is exposed to the weather should be painted about every three years, and where it is under cover an interval of five years may elapse.

The Control of Design and Construction.—It is quite apparent that the design of works of this class is a matter more for the engineer than for the architect. The problems are almost wholly of an engineering character; those of an architectural nature being entirely subservient to them. Architects could, however, render a great service in making the buildings of a more pleasing appearance, and their aid in this matter would be welcomed by engineers. As buildings, not only of workshops, but all classes are becoming more of engineering structures than formerly, through the adoption of steel frames and mechanical appliances, it would appear that in the future the principal direction of these works should be vested not in the architect but in the engineer.

NEW THEATRE IN SHAFTESBURY-AVENUE.—A new playhouse, to be known as the Hicks Theatre, has been erected in this thoroughfare. The building has two tiers only. The decorations are of the Louis XVI. period. The auditorium, which is circular in plan, will seat about 1,200 people. It is 50 ft. wide and 70 ft. deep, reckoning from the front of the proscenium to the back wall of the pit. The drapery, carpets, and upholstery are of a deep shade of rose du Barry. The theatre contains two boxes on each side of the proscenium. The pit holds some 500, and the gallery about 300 people, and there are 190 seats. The stage measures 70 ft. in width and 40 ft. in depth, the height to the gridiron being 65 ft. There are seventeen dressing-rooms, all provided with hot and cold water. The building has been erected by Mr. Walter Wallis, of Balham, from the designs of Mr. W. G. R. Sprague.

INSTANCES OF TWO CHURCHES IN CLOSE PROXIMITY.

WE have several instances in various counties in which two churches have been built close together. They are sometimes in the same churchyard, and at others within a stone's throw of each other; some are side by side, and others are almost in a line, the west end of one being close to the east end of the other.

There is a very interesting example of this duality in the county of Essex. The two edifices are known as Willingale Spain and Willingale Doe. They stand side by side, a few paces apart. Antiquaries tell us that Willingale Spain was a gift to the Priory of Blackmore from a Spanish noble, William de Hispania, the owner of neighbouring lands, to the end that his father and mother, as well as his wife and himself, should be held in remembrance by that community; and that Willingale Doe was founded by a French noble of the family of D'Eau, who also owned lands in the district. Both churches consist of a nave and chancel, and have a porch on the south side. A turret with a spirelet has been deemed sufficient arrangement by way of belfry for Willingale Spain, while Willingale Doe has a strong tower. The Spanish founder, who lived in the days of Norman rule, dedicated his building to St. Andrew and All Saints; the French noble, who lived in a later century, chose St. Christopher for the patron saint of his edifice. We may conclude there was a time when both churches were in the hands of the same masons, as both possess details that correspond in style. There are tombs in them telling of old griefs. The brasses on the floor of Willinghale Doe are of special interest, as they are considered to be representations of members of the family of Torold, who were descended from the individual figured in the celebrated Bayeux tapestry, and labelled in it "Hic est Turold." The two fabrics stand ripening in the Essex sunshine, full of memories and traditions. One homely legend has found its way into the talk of the country-side to the effect that these churches were built by two sisters. When one had brought the building of the first to a conclusion the other said she would build one, too; and her sister replied, "Willing, girl, do" (hence Willingale Doe).

Passing on northwards we may see two churches at Trimley, in Suffolk, in the same churchyard, facing the wide rural "street" or road with a pleasant radiance of serenity, both looking equally inviting and restful. They tell of the wealth and piety of this fine county. At Bury St. Edmunds the much finer churches of St. Mary and St. James are also close together, with an avenue of trees from the south porch of one to the north porch of the other.

There are more examples in Norfolk. There are two in one churchyard at South Walsham. Each possessed a tall tower, whereof one has been suffered to fall into decay, and now stands in isolated solemnity, open to the winds and split from the summit to the ground. The tracery in the windows of both edifices is exceedingly elaborate, and they have both an air in keeping with the reputation of the county for the richness and number of its fabrics. There are two more in close proximity at Antingham, one of which, however, is in ruins, and there are two more at Hackford and Reepham, near Norwich, that are quite close together. The east end of one of these last, St. Michael's, is but a short distance from the west end of St. Mary's, Reepham. They both have strong towers partially covered with greenery, but only one has been finished off with finials. This is a part of the land where the churches are rich in superb oaken roofs, with carven angels upholding the beams, and grand painted and gilded screens, and, curiously, on the other hand, where we may yet see some that are still simply covered in with thatch.

There are two fine churches in one churchyard near Louth, at Alvingham. One is dedicated to St. Adelwold and the other to St. Mary. They stand about 30 ft. apart in the deep, soft grass among shrubs and tombstones. Both have western towers, and, with the exception of a battlemented parapet on St. Mary's, their general outline is alike. Neither possesses the tall, slender spire that is usual in this part of the country.

Going further northwards, in Holy Island, off the coast of Northumberland, mentioned by the Venerable Bede as a semi-island because when the tide is low it is possible to cross on foot the miles of sands that stretch between it and the mainland, there are two more churches in one churchyard. One of them is the great famous Norman priory church, now in picturesque ruin (hanging ruins the remains are called on account of a high transverse rib of the tower left standing out against the sky), and the other, 52 ft. westwards of it, is the parish church, or St. Mary's. There is a village on the island with about 500 inhabitants in winter, increased in summer by visitors, and there is a new hotel, some inns, a castle or fort in which is a small garrison, and a "heugh" on which fishermen keep a constant look-out; but the presiding genius of the place is still St. Cuthbert, the vigorous ascetic who departed to the mercy of God many hundreds of years ago. The shores are strewn with his beads (encrites); traces of a tiny chapel may be made out among the rocks to which he used to retire to pass away days in solitude, meditation, and prayer; and the priory church was the place of his burial before his remains began the long journeys that ultimately ended at Durham. These two churches in their ocean setting, swept by the winds off the great grey North Sea, are like magnets to many minds. The register of St. Mary's, dated 1578, tells of many deaths by drowning in consequence of people being overtaken by the incoming tide or by sinking into quicksands. It has an entry concerning marriages, dated 1660, to the effect that they were prohibited at various seasons that are there set forth. The vessels used here in Holy Communion are the same that the villagers have held in reverence since the days of Queen Elizabeth.

In the same Border country, at Bywell, there are two churches about 150 yds. apart. One is dedicated to St. Andrew the other to St. Peter. They are familiarly distinguished as the black or white churches. A local historian quotes a popular impression that one of them was built in consequence of a quarrel for precedency between two sisters. The evidence of the masonry, however, completely sets aside this tradition, as it assures us of a long interval of time between the dates of the two erections. In the old moss-trooping days Bywell carried on a manufacture of stirrups, bits, curbs, and buckles, so much in request by riders and raiders, and it was usual for the inhabitants to drive their cattle into the long, wide street nightly and take it in turn to watch at both ends of it. In tribulations the churches were used as places of refuge, as when a great rising of the Tyne occurred in 1771. A valuable stud of horses would have been drowned but for the protection of the pews, and one mare, it is recorded, that belonged to the father-in-law of Thomas Bewick, the wood engraver, in its terror saved itself by mounting on to the Communion table.

Turning southwards now Evesham comes to mind. Here in the parochial churchyard in this pleasant district of sunny gardens and orchards are two churches in close companionship, besides a magnificent detached tower 110 ft. high. Both churches are believed to have been founded by the ecclesiastics of the neighbouring Abbey. One is dedicated to St. Lawrence the other to All Saints. They are both regarded with great admiration on account of the richness and beauty of their details, which include fan-tracery in the roofs, and both have western towers with spires. Remembering the famous battle fought at Evesham in 1265 between Simon de Montford, Earl of Leicester (often recognised as the founder of the House of Commons), and Prince Edward, better known to us as King Edward I., this superb group in its lavish expenditure and concentrated ideality seems in some way commensurate with the heroism displayed on that occasion and in keeping with its renown.

A few miles away still in the same centre of fruit growth, at Pershore, there are two more venerable churches only divided by a roadway. They are fine fabrics, full of antique grace, respectively known as St. Andrew's and Holy Cross, the last-mentioned dedication only applying to the nave, the rest having been dedicated to several saints in conjunction. At the Reformation, when the Abbey was suppressed, the

parishioners bought this edifice for 400*l*. The choir of four bays is full of architectural charm. It is 102 ft. in length and has a vaulted roof of great beauty. The central tower, the very core, as it were, of the old Abbey, looks over the adjacent country benignly as with a benediction.

Still further south, in Wiltshire, there is an instance of two churches near together at Alton Barns and Alton Priors; the former known as St. Mary's, the latter as All Saints'. They are about 300 yds. apart, and set in meadowland, through which run two small streams. Cambridgeshire, too, has an example at Swaffham. This village is spread into three parishes, and has three churches, two of which are in one churchyard on the top of a hill. One is dedicated to St. Mary, and is known as Priors or Little Swaffham, and the other as St. Cyric's; speaking of them both they are sometimes called Swaffham Two Churches. Being on an eminence they may be truly said to lend enchantment to the view. Regular Divine service is now only held in St. Cyric's.

This is but a brief glance across the kingdom. The proximity of St. Margaret's to Westminster Abbey is another instance, and doubtless the readers of these notes will be able to add others to those set down some, perhaps, that have been and are now no more, like St. Faith's below old St. Paul's, and may be glad to be led into reminiscences that are likely to be a source of much pleasure.

S. W.

DIARIES AND ALMANACS.

MESSRS. HUDSON & KEARNS (Stamford-street, S.E.) have issued their very useful blotting-pads for 1907, and we have pleasure in again calling attention to them. These blotting-pads are admirably arranged, neat in appearance, and convenient in form, and they wear so well that if it were not for the calendar and date remembrancer portions there would be no need to renew them at the end of the year. Two excellent pads are No. 8A (price 7s.) and the "Bankers" (price 8s.), which show calendar, indexed book-diary, a tear-off space for daily engagements, etc., and a 10-in. rule, while No. 8A, though smaller than the "Bankers" pad, has space for standing memos and a tear-off writing space. These and other pads are very serviceable, and it would be difficult to suggest any improvement upon them.

The "City Diary" for 1907 (W. H. & L. Collingridge, 148 and 149, Aldersgate-street, E.C.) is the forty-fourth annual issue of a compact and neat little diary, which is a handbook to the City proper as well. The prefatory information includes a list, with addresses, of the members of the Corporation; details of the various other governing authorities of the City; a list of the City churches, with the clergy and vestry clerks; summarised statements, giving the fees charged, concerning the City's schools; and other information. The diary itself has three days on a page, and is interleaved with blotting paper. The price is 1s.

The "Gloucester" Diary and Director's Calendar for 1907 is the twelfth year of issue of a useful little work published for the Gloucester Railway Carriage and Wagon Company, Ltd., by Mr. F. J. Brooke, of Gloucester. The diary includes a list of the stations and junctions attended by the company's wagon repairers.

Mr. W. Monk's "Calendarium Londonense" for 1907 is illustrated by an etching of the Hyde Park Screen as seen from the wide road space at the end of Piccadilly, with the crowded traffic duly represented, a motor-carriage in the foreground, as characteristic of the present moment. The writing of the calendar, and the little decorative devices accompanying it, are exceedingly picturesque, and an advance on those of previous years. The calendar is published by Messrs. W. Monk and Elkin Mathews, Vigo-street.

THE FENCE, REGENT'S PARK.—In a "Note" in our issue of October 27, we commented upon the foolish proposal to substitute an iron railing for the appropriate oaken fence around the park. We observe that the ill-advised proceeding is being carried out, and that the new railing has already been erected along the subscribers' enclosure, by the lake, in front of Hanover, Sussex and Clarence terraces, between Hanover and Clarence gates.

Architectural Societies.

NOTTINGHAM ARCHITECTURAL SOCIETY.—A meeting of the Society was held in their rooms on the evening of the 18th inst., when Mr. P. H. Ellis read a paper on "The History of Architectural Education." At the commencement reference was made to Vitruvius as the first ancient writer upon the subject of architecture, whose works have reached our time, and who is reputed to have been born in the year 80 B.C. The school of architecture founded by Crassus at Rome for the instruction of slaves was quoted as probably the first organised effort in this direction. With the object of providing skilled architects and workmen to meet the demands of his day, Constantine the Great later founded architectural schools in Europe and North-West Africa, and is said to have offered premiums to those who would have their sons brought up as architects, and to skilled workmen who would bring up their sons to their own trades. The Comacines as a link between the Roman Collegia and the art and trade guilds of the Middle Ages were next dealt with; "Leader Scott's" extravagant estimate of whose influence was quoted with considerable reserve. The earlier monastic or Cluniac school, whose architecture was destined to produce in the XIIth century monuments freed from the last Roman traditions, and the Saracenic schools next received attention, followed by a concise history of the great guild system, which played so important a part during the Middle Ages, and the sphere of whose influence was traced by the author in gradually diminishing degree down even to Wren's day. The revived Classic movement in architectural history was traced from the close of the XIVth century, when, after centuries of oblivion, the original Codex of Vitruvius was once more brought to light, the study of which, combined with the measurement and reproduction of the noble remains of Imperial Rome, united in forming the Renaissance school of early days. Elizabethan methods were also touched upon, at which period we get our first introduction to the inclusion of travel as a factor in architectural education. Time did not permit entering in any detail upon the modern aspect of the subject, and the paper concluded with an account of the foundation in the year 1768 of the Royal Academy, when Thomas Sandby, R.A. (a native of Nottingham, by the way), was appointed the first Professor of Architecture there.

GLASGOW INSTITUTE OF ARCHITECTS.—The usual quarterly meeting of the Glasgow Institute of Architects was held on the 19th inst., Mr. Monro, President, in the chair. The meeting approved of a report by the Council regarding a proposal to form a building fund for new premises for the Institute, and also of a letter of protest sent to the Corporation regarding the conditions of the Riddrie estate competition. It was reported that the Council had had under consideration the proposed Corporation by-laws, and also the proposed Bill on similar lines for England and Scotland. The Council saw nothing in the proposed Corporation by-laws to which special objection could be taken, but it was agreed to watch the proposed Bill, and to take steps to have a clause introduced providing that it should not apply to Scotland, as the circumstances in Scotland are different from those in England. The Secretary reported that all the applications for the Fellowship of the Royal Institute of British Architects which had been sent through this Institute had been passed by the Royal Institute, and that the time for similar applications had been extended for another year. It was pointed out that the course of training in the Glasgow School of Architecture covers the whole ground of the Royal Institute of British Architects examinations, and it was agreed to ask the Royal Institute of British Architects to recognise the work of the school as follows:—(1) That the diploma or senior certificate of the Glasgow School of Architecture should exempt the student from the Preliminary and Intermediate Examinations of the Royal Institute of British Architects; and (2) that the corresponding class work done in the Glasgow School of Architecture should be accepted as "testimonies of study" for the Final Examinations of the Royal Institute of British Architects.

METROPOLITAN WATER BOARD.

AT the sitting of the Metropolitan Water Board on Thursday last week the Works and Stores Committee reported that on July 20 the Board accepted the tender of Messrs. O. Wright & Co. of 22,666*l*. 2s. 10d. for the construction of a pipe line between Child's Hill to Cranley Gardens, but the tenderers found they had made an error in their bill of quantities which would have the effect of increasing their tender by 2,000*l*. Afterwards they found other errors, and were unable to do the work for less than 26,500*l*. The Committee then approached Messrs. D. Bell & Co., the next lowest tenderers, but on checking the figures certain arithmetical errors were found. After careful consideration the Committee recommended that tenders from twelve selected firms of contractors be invited for the work.—This was carried.

Quantity Surveyors.—It was resolved to add the name of Mr. C. W. Brooks to the list of quantity surveyors recommended for employment by the Board.

Gas House Bridge, Hoddesdon.—On the advice of the Chief Engineer it was resolved to invite tenders for the reconstruction of this bridge.

WESTMINSTER CITY COUNCIL.

THE usual fortnightly meeting of the Westminster City Council was held on Thursday last week.

Exclusion of the Public from Vincent-square.—Reporting on a resolution from the Westminster branch of the National Democratic League asking the Council to search the local records to ascertain by what authority the public were precluded from having access to Vincent-square, the General Purposes Committee recommended that the League be informed that the Public School Act, 1868, enacted that the governing body of Westminster School should keep the square open as an open space for the recreation of the boys belonging to the school.—This was agreed to.

Rebuilding of Westminster County Court.—The Committee reported that a further letter had been received from the Office of Works in reference to this matter, stating that they could only repeat that they were satisfied a new building could be erected on the existing site which would be adequate to meet all the requirements of the district. They therefore regretted they could not recommend the Government to entertain the proposal to acquire additional land in order to provide a building in excess of what they considered to be the necessities of the case.

Piccadilly Improvement.—The Improvements Committee presented a report *re* an offer they had made to the London County Council to bear the expense of the paving and other works connected with setting back the railing in Piccadilly at the Geological Museum, provided the necessary arrangements could be made with the Office of Works. They stated they had received a letter from the London County Council in which they said that the First Commissioner of Works had arranged for the setting back of the railing subject to certain conditions.—It was agreed to accept the conditions and to complete the work at the earliest possible date.

Amending the Drainage Law.—The Works Committee reported the receipt of a letter from the London County Council with reference to representations made to them by the Poplar Borough Council and other borough councils, suggesting that a clause should be inserted in the next London County Council General Powers Bill to amend the law relating to combined drainage, so as to throw upon owners of premises the cost of maintaining all combined drainage systems. They had also received a letter from the Fulham Borough Council referring to the Conference of Borough Councils held on the subject, and the joint memorial presented to the Local Government Board urging the necessity of amending legislation being introduced at an early date to deal with the question. They also sent copy of a letter from the Local Government Board stating that they were not at present in a position to promise to introduce legislation.—In view of the attitude taken up by the Local Government Board the Committee thought that no good purpose would be served by adopting the suggestion of the Fulham Council, and therefore they made no recommendation on the subject.

INTERNATIONAL SOCIETY OF SCULPTORS, PAINTERS AND GRAVERS.—At the Council Meeting of the International Society of Sculptors, Painters and Gravers, held on December 18 Mr. Francis Howard was elected honorary secretary, in succession to Mr. T. Stirling Lee.

DECORATIVE TRADES' EXHIBITION, GLASGOW.—An exhibition, organised by the Glasgow Master Painters' Association, under the auspices of the National Association of Master Painters, in connexion with the annual conference of the trade, which takes place in the city early in January, will be opened shortly in the Fine Art Institute, Glasgow.

Fifty Years Ago.

FROM THE *Builder* OF DECEMBER 27, 1856.

"FROZEN OUT"—A SANITARY HINT.

THE writer of this has taken an opportunity of lately visiting some localities where the houses, new and smart outside, show condition internally to cause alarm. In some instances working men occupied three rooms, probably a couple of kitchens and place above. In summer-time the numerous little children are separated and spread about; when cold weather comes the mother fears that they will catch cold, and the beds of the whole are huddled into one room, the door of which, and also the window, is bound with leather or list, and in some instances the chimney is probably stopped up, and no means are allowed for the admission of the necessary element of health, life, and strength. There are generally other families in the same house, who adopt similar precautions against "Jack Frost" and the north-east winds, and then think cosily "that their doors are all closed and their windows all barred," and that the pinching enemy has been set at defiance, forgetting or not thinking that they are raising in the garrison a more dangerous enemy than without the walls, which might readily and would be, in some cases, certain to strike down old and young. We mention this feeling from personal observation that great necessity exists for doing so, and earnestly urge on our readers the necessity of cautious and common-sense arrangements, and to impress upon landlords the need there is for having all staircases, and as far as practicable the rooms of such houses as above referred to, vigorously ventilated. To return, however, after this long digression to the "freezing out," no one will for a moment doubt that in addition to the shutting out of the air and overcrowding, that the stopping of the water supply cannot fail to add to the evil: the washing-day is put off, and linen, etc., stored dirty in close closets, etc., and it becomes a matter of difficulty to get the children, floors, etc., attended to as usual. In ordinary health this is bad, but when sickness and death are in a house the need of these remarks is more evident, and their truth will be recognised by many a district surveyor and London missionary.

*** We fear that the hygienic warning given in our columns fifty years ago is as much needed now. Even among the better educated classes in this country the aversion to opening windows more than can be helped is very noticeable, and we have heard it remarked on by visitors from Australia, where people seem not to be so afraid of open air. Among the lower classes one often finds evidence that windows are never opened at all, from one year's end to another.

Illustrations.

THE WALDORF HOTEL, ALDWYCH.

THE Waldorf Hotel and Restaurant forms part of the London County Council improvement scheme, and is situated in a prominent site in Aldwych between the two new theatres, Waldorf and Aldwych.

It is designed in a bold manner to be in keeping with the strong lines of the Gaiety Theatre, with which it will often be seen in conjunction. The lower story is of white Aberdeenshire granite, and otherwise the building is of Portland stone, with Westmoreland slates and copper on the roof.

The Louis XVI. style has been adopted both externally and internally. The building is of fireproof construction. The floors are of reinforced concrete, and steel is largely used. The plan of the bedroom floors has been modelled on the latest American hotels, having numerous bathrooms *en suite* with bedrooms, so that visitors may, if they desire it, have the convenience of a private bath-room. The work is being rapidly pushed on with a view of opening next autumn.

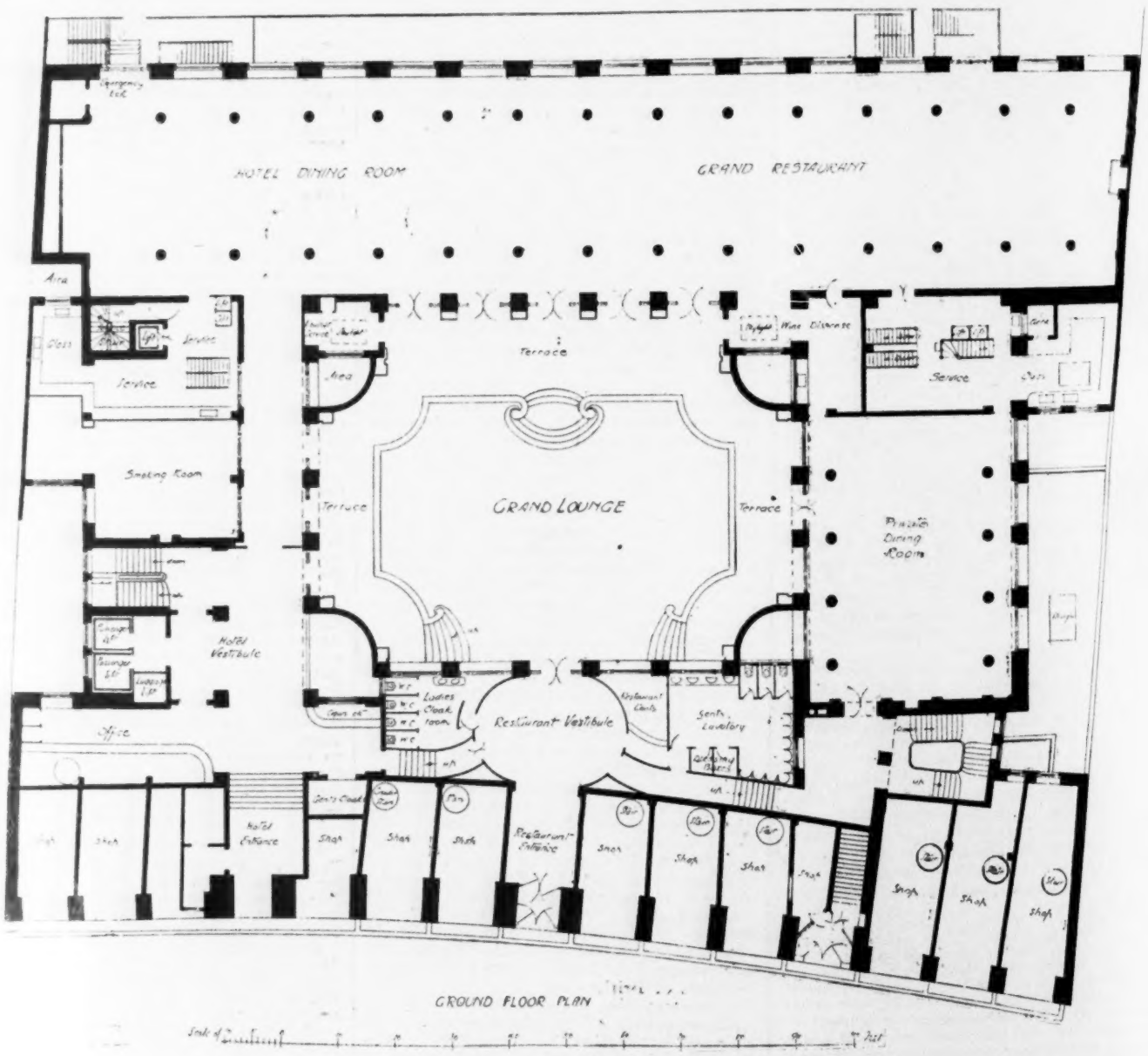
Messrs. the Waring-White Building Company are the builders, Messrs. Waring & Gillow the decorators. Mr. Emil Fuchs is responsible for the sculptured frieze.

Messrs. A. Marshall Mackenzie & Son are the architects.

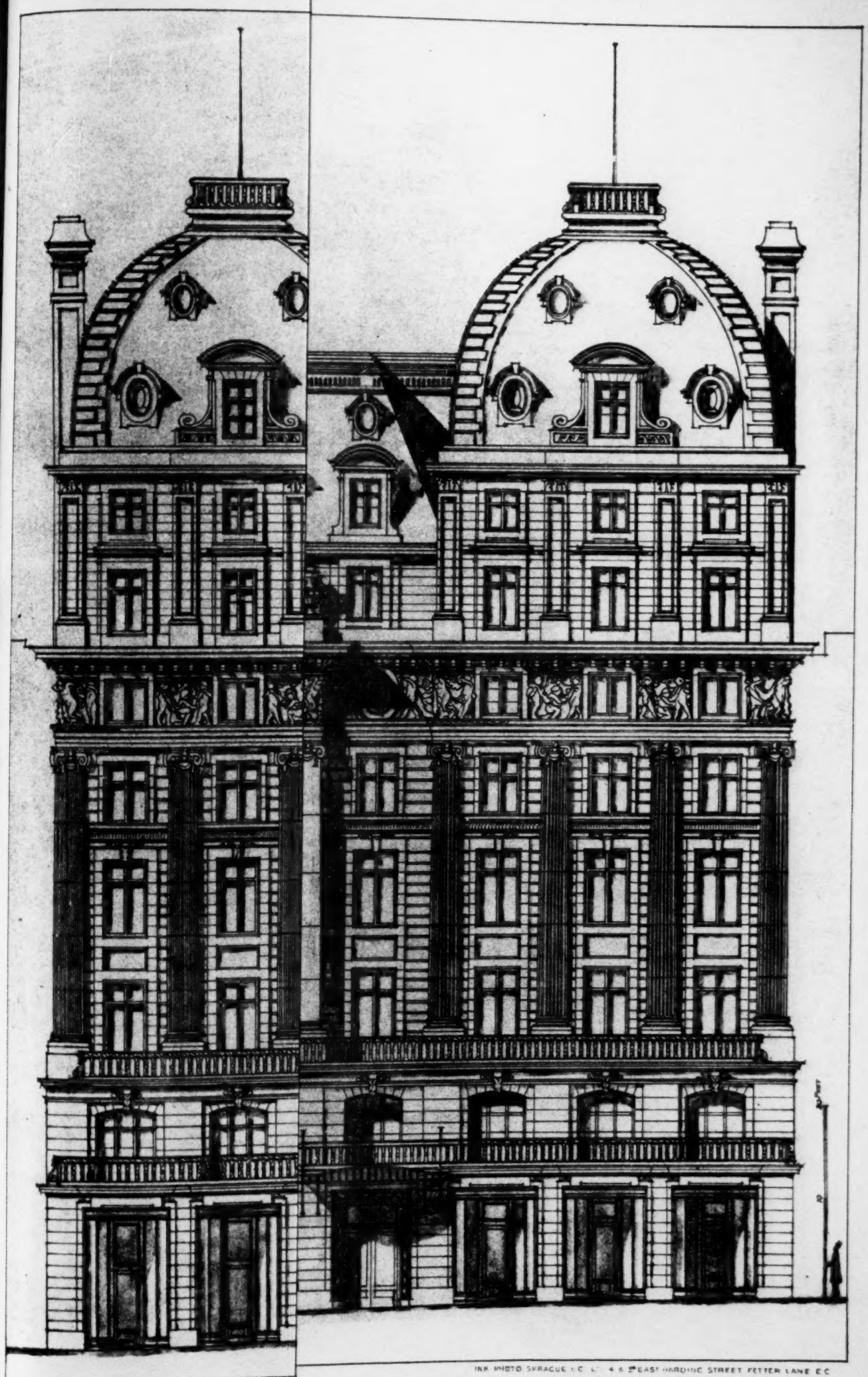
THE BREWERS' HALL: MEASURED DRAWINGS.

THE drawings here reproduced gained for their author, Mr. Sidney W. Davis, the Royal Academy silver medal for a set of architectural drawings. The original drawings, finished in pencil, are a particularly good set, combining effect, care and accuracy.

The decorative details are not of a very pure type, but the design of the side of the room illustrated in "Section looking South," shows a very well-proportioned arrangement of mullioned windows and panels, and the carver has known how to give the wreaths above each window a graceful line and fall.



Waldorf Hotel. Plan.



INK PHOTO SPRAGUE & C° L^TD 44 & 3 EAST HARDING STREET FETTER LANE E.C.

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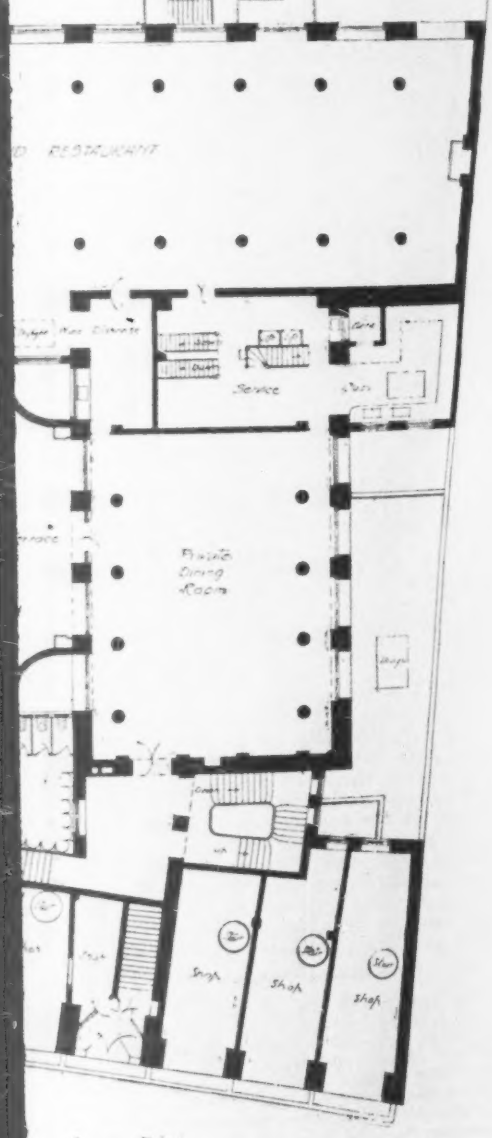
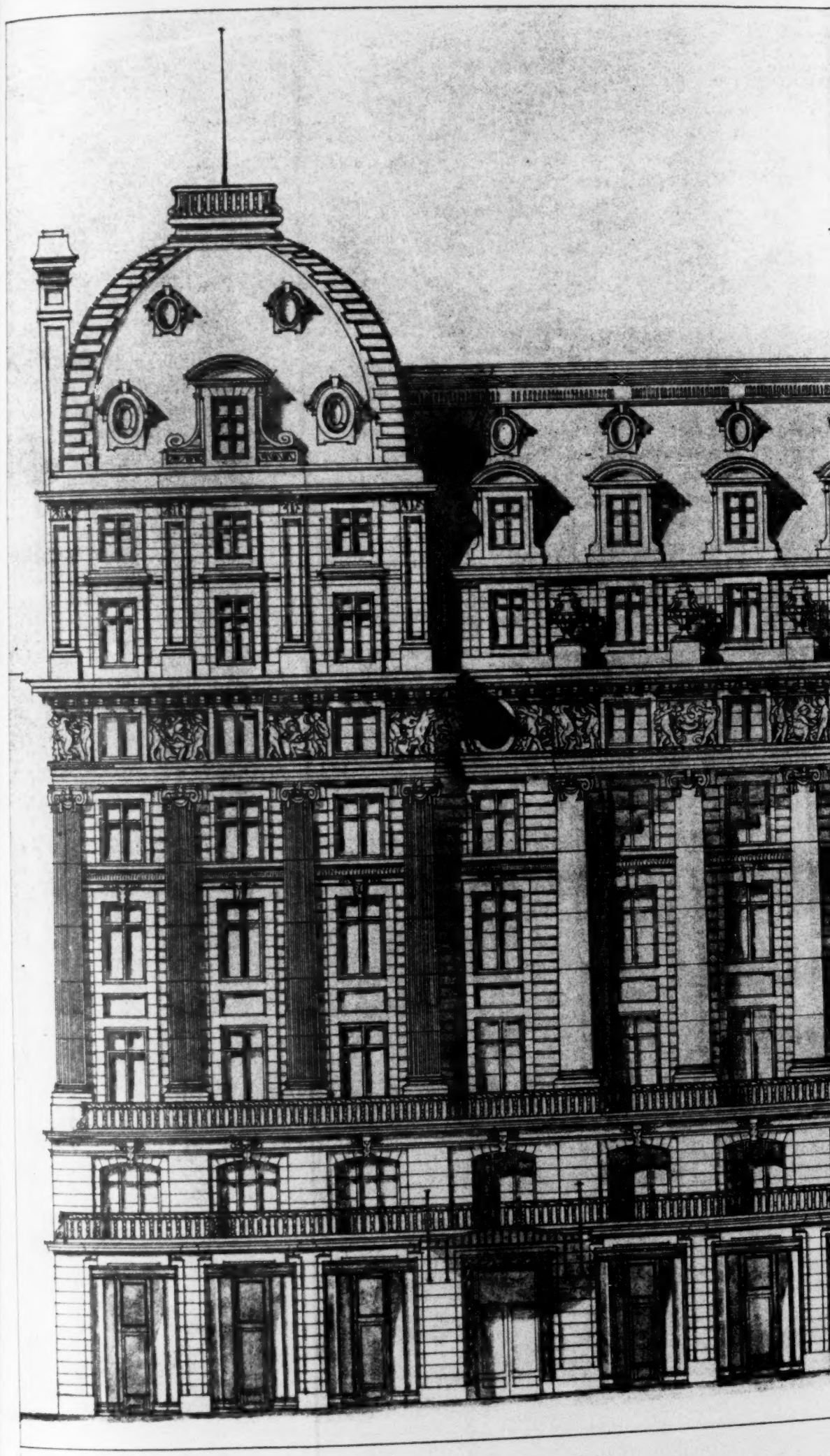
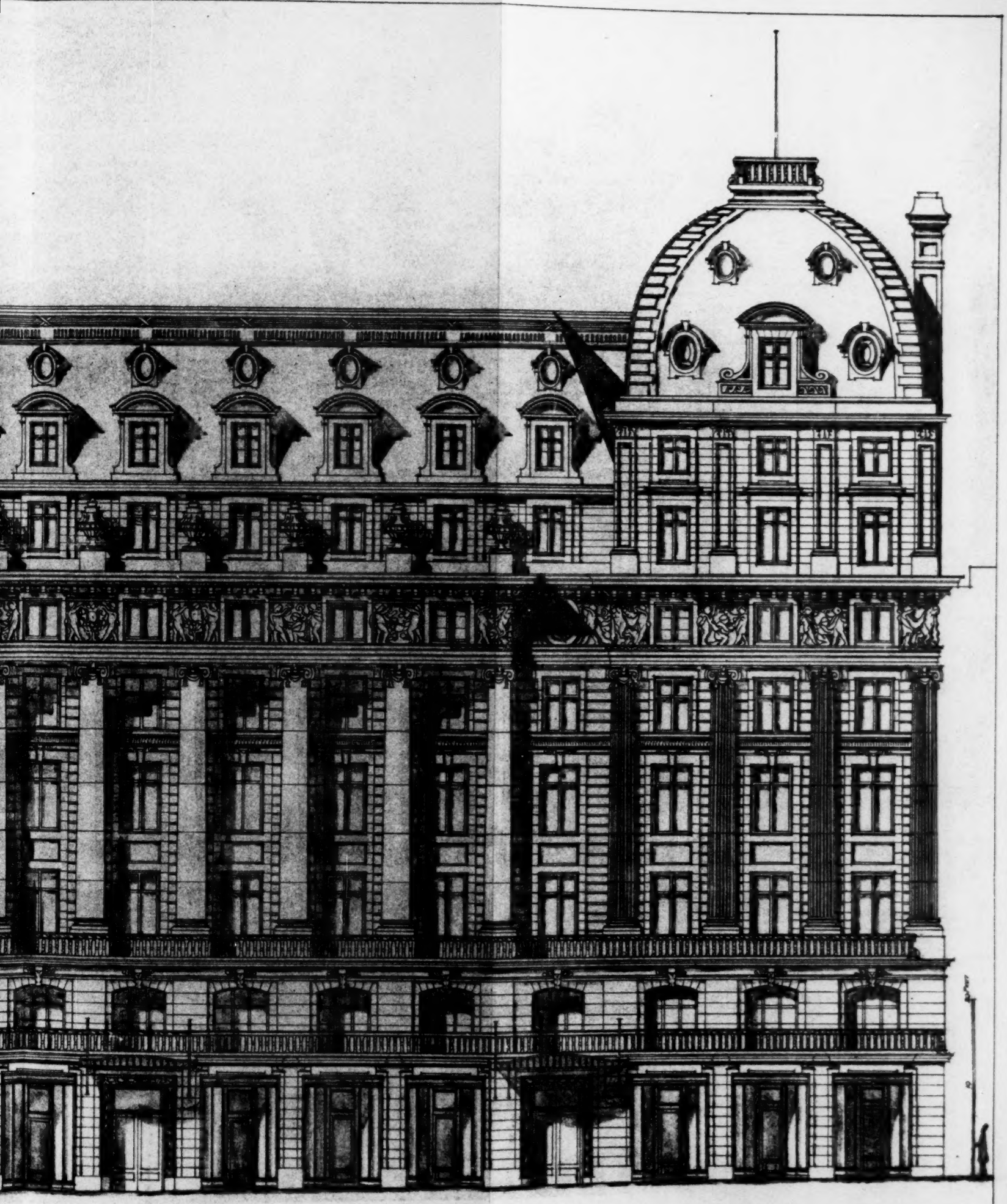




THE WALDORF HOTEL, A



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LDWYCH.—Messrs. A. Marshall Mackenzie, A.R.S.A., & Son, Architects.

THE · HALL · of the
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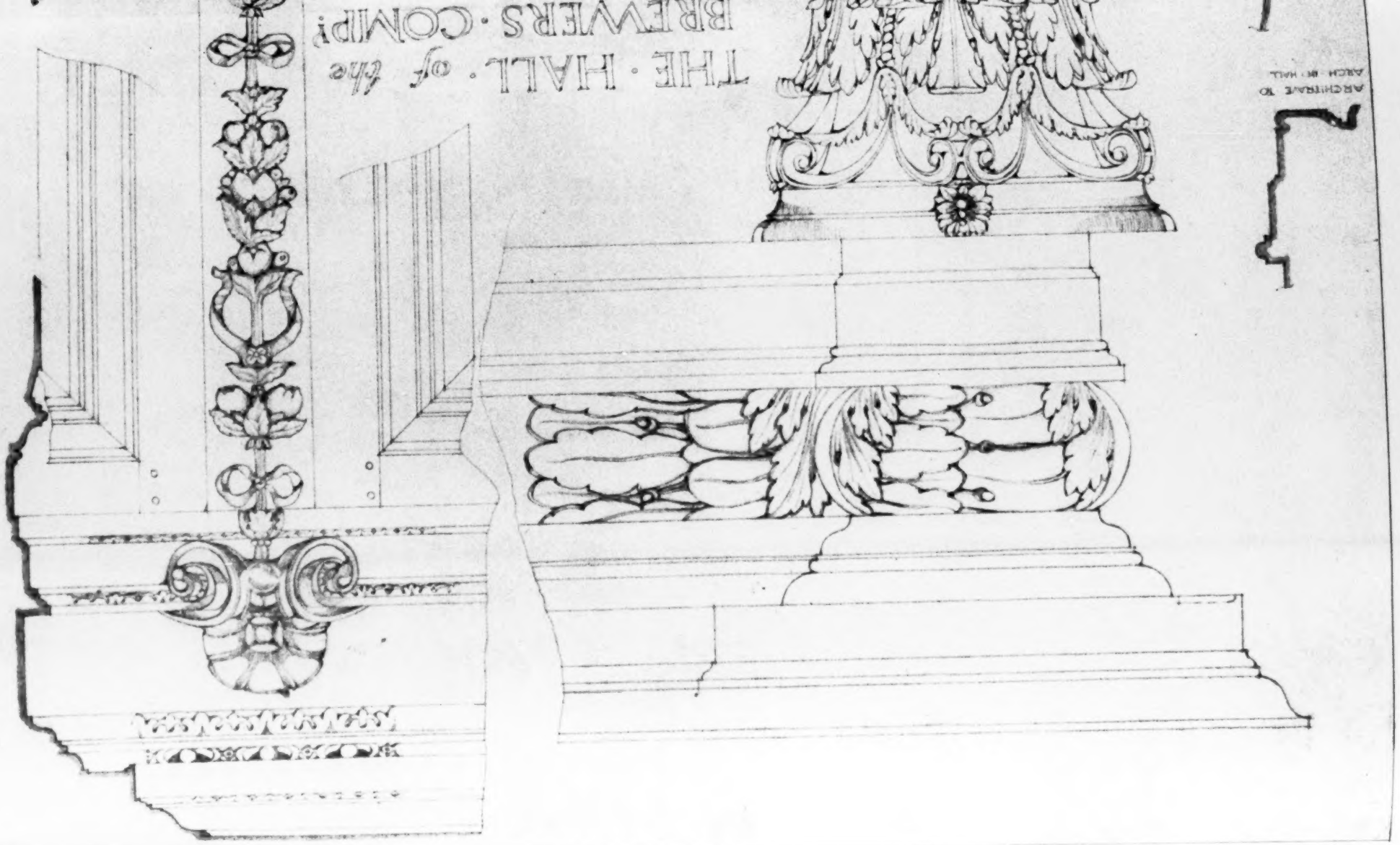


ARCHITRAVE TO
ARCH · BY · HALL

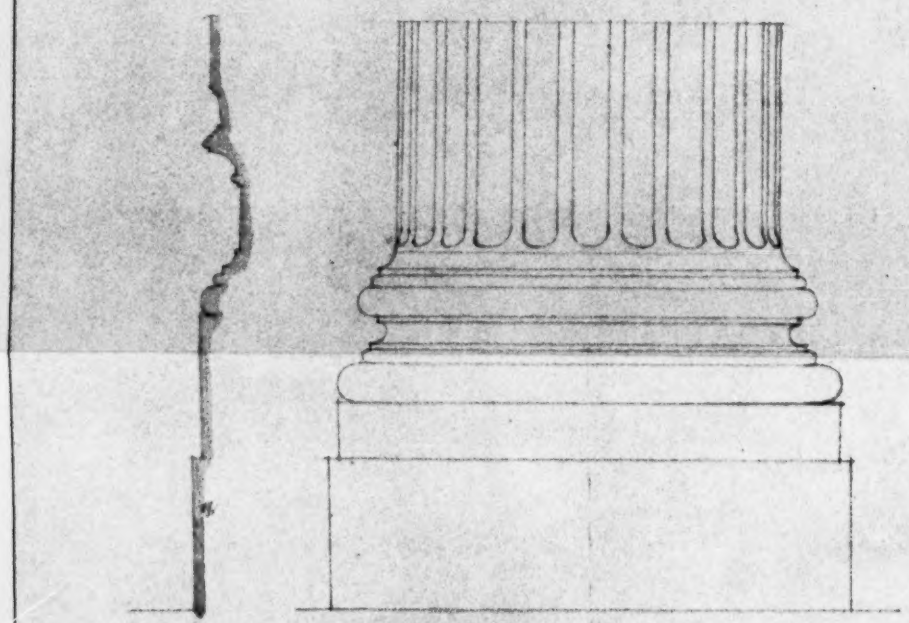
BREWERS · COMP!

Details of Hall & Court Room Adjt

Note: The Carving throughout is of Oak also the Panelling & is attributed to Grinling Gibbons: That in the Court Rm is superior in texture to that in the Hall which is rather Coarser in Execut.

CAPPING MOULD TO ARCHITRAVE IN HALL

MOULD UNDER WINDOW BOARD



SKIRTING MOULD & SKIRTING AROUND HALL

Column & Entablature to Screen in Hall

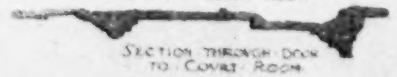
SECTION ABOVE PEDIMENT TO FIREPLACE IN COURT RM

SECTION THROUGH FIREPLACE IN COURT RM

CHAIR RAIL IN COURT ROOM

PLINTH IN COURT ROOM

CAP TO PILASTER ON DOOR IN COURT ROOM



SECTION THROUGH DOOR TO COURT ROOM

BASE TO PILASTER ON DOOR IN COURT ROOM

Detail of Carved Panel & Cornice around Court Room

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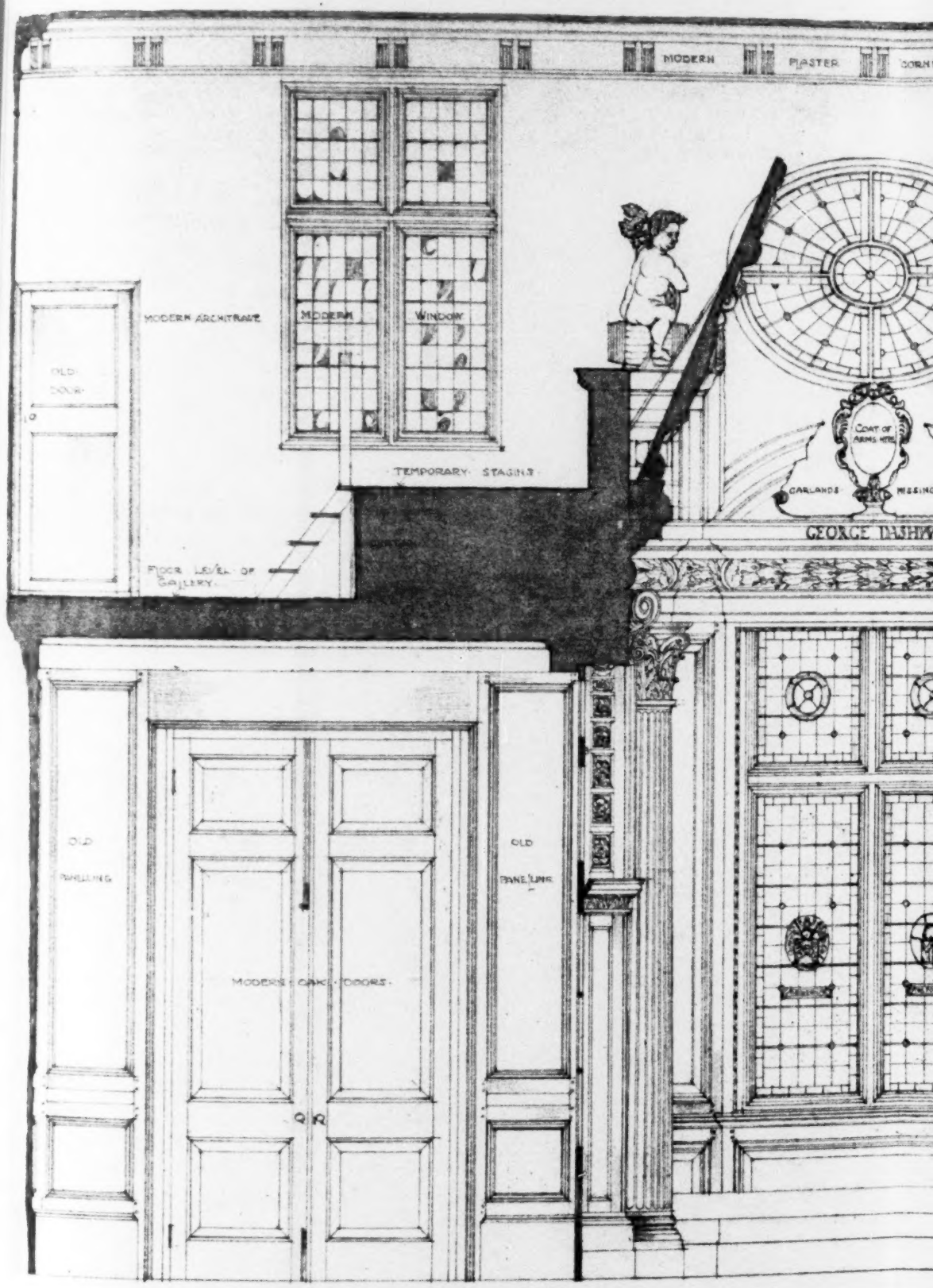
Royal Academy Silver Medal, 1906.

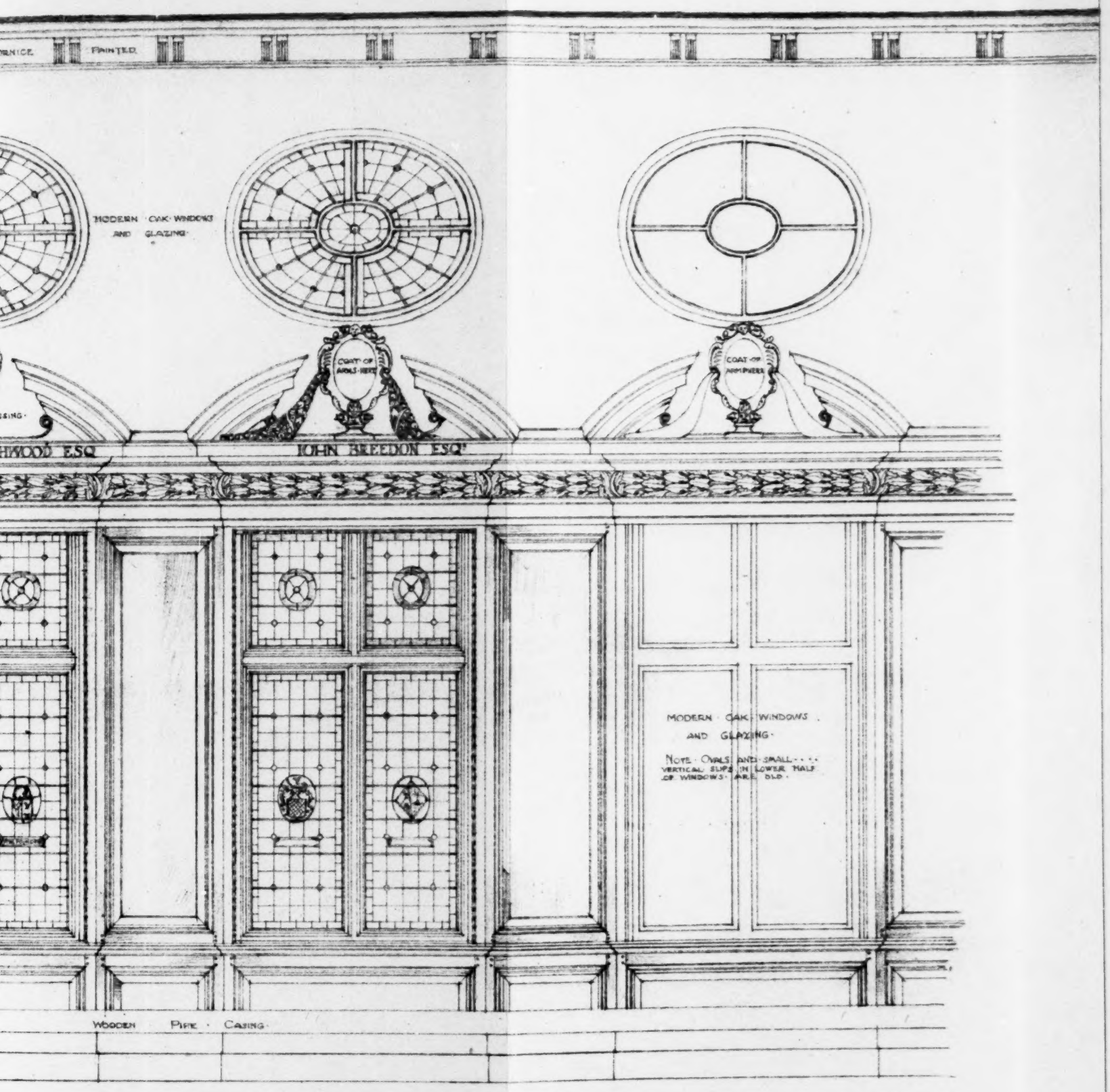
THE HALL OF THE BREWERS' COMPANY.—Measured and Drawn by Mr. Sidney W. Davis.



Section

Royal Academy Silver Medal, 1906.

THE HALL OF THE BREW



on · looking · South :

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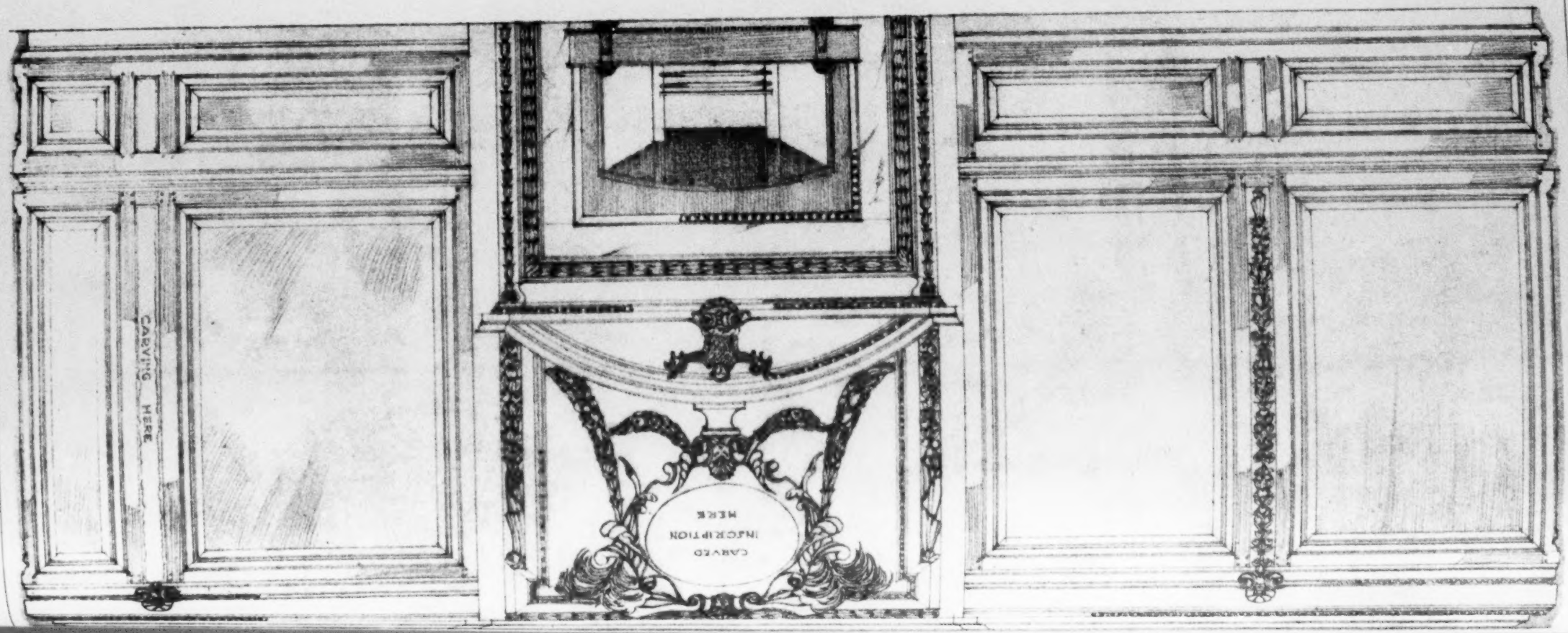
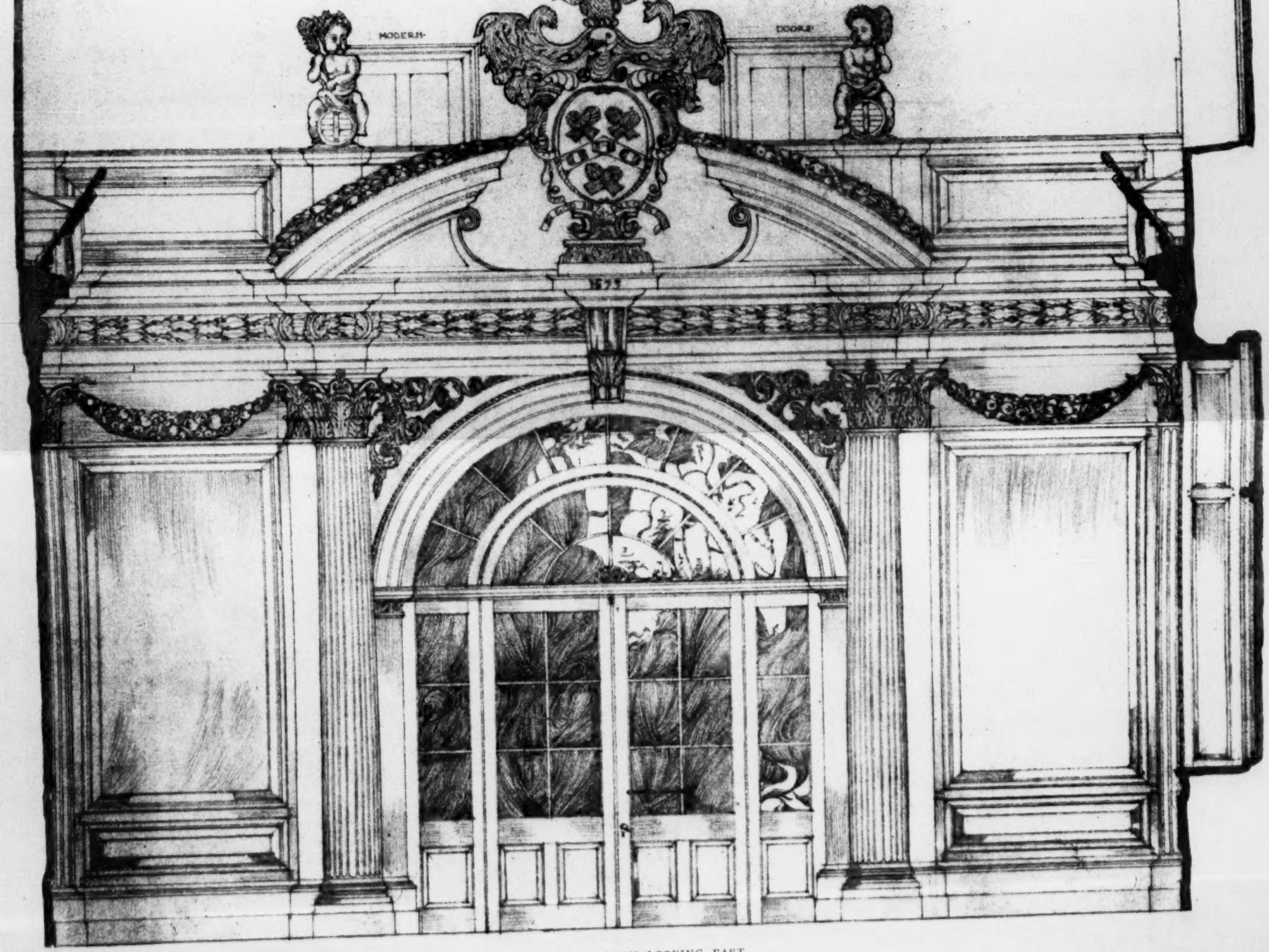
EWERS' COMPANY.—Measured and Drawn by Mr. Sidney W. Davis.

ELEVATION LOOKING SOUTH.





SECTION LOOKING EAST.

SCALE 5 0 5 10 15 OF FEET

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Royal Academy Silver Medal, 1906.

THE HALL OF THE BREWERS' COMPANY.—Measured and Drawn by Mr. Sidney W. Davis.

Competitions.

BANGOR COLLEGE BUILDINGS.—In our last issue we briefly mentioned the result of this competition. The following is the award of Sir Aston Webb, R.A., in respect of the designs sent in for the new College buildings for the University College of North Wales, Bangor:—"I have now carefully examined the four sets of designs, with the reports of their authors, that have been sent in for the proposed new buildings, and I am of opinion that all of them have sufficiently complied with the conditions of competition to entitle them to the premiums offered. I have also made a careful examination of the site and its surroundings, and I am of opinion that the design that best meets the requirements and the conditions laid down for the competition is that marked No. 2, and I therefore place this design first, and consider that the author is entitled to the premium of 250*l*. Judging from this design, I feel confident the author would provide a satisfactory building, and, subject to his being prepared to meet the Council in making any variations in the plan and arrangements that they may think desirable after consultation with him, and to his being able to justify his estimate, I should strongly recommend the Council to appoint the author of the design marked No. 2 as the architect for the new buildings." The College Council met and appointed as their architect the author of the successful design. This proved to be Mr. Henry T. Hare, London.

BIRMINGHAM COUNCIL HOUSE EXTENSION SCHEME.—The design of Messrs. Ashley & Newman has been accepted for the extension of the Council House. The plans will be on view at the Council House until January 10.

Books.

Building Cases, being a Digest of Reported Decisions Affecting Architects, Surveyors, Builders, and Building Owners. By F. St. JOHN MORROW, LL.D. (Dub.), Barrister-at-Law. (London: Butterworth & Co. 1906.)

THE developments of modern life, the extension of municipal management, and, we fear we must add, the complexity of modern legislation have much increased the difficulties experienced by architects, surveyors, and builders in the practice of their professions and occupations, and a knowledge of many branches of the law has now to be added to their other qualifications. Text-books dealing with the legal aspect of building questions have become a necessity, and law reports are no longer only to be found in the library of the lawyer. One of the latest additions to the legal literature for the above is a digest of building cases by Mr. F. St. John Morrow, which the author hopes may also be of service to those engaged in local government and to lawyers. In this work the author has set himself the difficult task of collecting the cases affecting architects, surveyors, builders, and building owners and arranging them under alphabetical headings in the form of a digest. One of the drawbacks to a digest has been overcome by the addition of a very comprehensive index, which enables the reader to obtain a connected view of the subjects dealt with in the decided cases, and in the appendix to the work will be found a form of agreement and schedule of conditions for building contracts printed by permission of the Royal Institute of British Architects; the professional practice as to the charges of architects, approved by the above Society; and Rydes' scale of surveyors' fees.

The cases collected in this digest the author has derived from all sources, not confining himself to the law reports, and they are printed in good type, and are easy of reference. In an alphabetical arrangement few people would agree exactly together in adopting a system, and some persons abhor cross-references; therefore it may be a hypercriticism to point out that there are headings, "Air," "Ancient and Other Lights," and "Light and Air," an arrangement that might lead a person consulting the work to overlook some of the cases in the absence of a cross-reference.

It must, of course, be borne in mind that the cases have been collected with a special reference to building matters, and not with the view of supplying the leading case on points of law generally. As an example of this the heading "Negligence" may be referred to; under "*Volenti non fit injuria*" will be found a case decided in 1888 by a judge of first instance, but the leading case on this maxim is now Smith *v.* Baker, decided by the House of Lords in 1891.

The author states that he has included in the cases which he has collected in this volume some decisions which have been overruled by subsequent judgments in the High Court, "because, although they can no longer be relied upon in courts of justice, they frequently furnish valuable assistance to those whose duty it is to advise parties as to their legal position." We confess we cannot follow the author in the above reasoning, and in our opinion it is a matter of regret that he has included any cases no longer law in this digest, especially as, so far as we can see, an indication has not in every instance been given as to which are the cases to be received with caution, and therefore the reader is left in some uncertainty as to whether he can rely on a case or not, and the value of the work is thereby lessened.

Laymen who consult a book in the form of a digest must bear in mind the distinction which exists between a digest and a text-book. In the former the "headnote" is the only form that can be adopted, and the statement of law contained in the headnote must be read strictly in connexion with the facts there set out. Text-book writers generalise the law as laid down in the decided cases, and endeavour to deduce general principles so as to enable the reader to determine which principle will apply to the facts of his case. A digest of cases is often useful as an accessory to the text-books, especially to those who have not any series of reports in their library, and the present volume has no doubt been published to meet this requirement.

Emden's Building Contracts, Building Leases, and Building Statutes. Fourth edition. By JOSEPH BRIDGES MATTHEWS and W. VALENTINE BALL, Barristers-at-Law. With a Glossary of Architectural and Building Terms, Revised and Extended by MAURICE B. ADAMS, F.R.I.B.A. (London: Butterworth & Co. 1907.)

RATHER more than ten years have elapsed since the appearance of the third edition of this volume, that edition being the work of His Honour Judge Emden and Mr. Henry Johnston. The present volume consists of over 700 pages, exclusive of an extensive index of nearly 100 pages, which greatly adds to the usefulness of the work, and tables of cases and statutes. The table of cases has been rearranged on an excellent model, with references to all the recognised law reports, and where the cases are reported in more than one report all the references are given, which is a system we should wish to see generally adopted, as practitioners have often only one set of reports, and a reference to one particular series much limits the usefulness of a text-book. Besides cases reported in the legal reports some others are referred to which are only to be found in the *Times* and the *Builder* and other journals. New forms have been added, some of these being obtained from the new work "The Encyclopædia of Forms" by permission of the publishers. We have given prominence in the first instance to the above features because in a book of this size and character the ease of reference is of the first importance. The work appears to have been brought well up to date; we find the very recent cases cited. The text is clear, and the various propositions are laid down concisely, references being given to the cases which are set out at the foot of each page. The glossary of architectural and building terms, which was omitted from the last edition, reappears, having been enlarged and revised. Certain matters incidental to the main subject, such as the liabilities involved in certain covenants in leases by landlords and tenants in regard to rates, taxes, and statutory impositions, and the liabilities imposed by certain sections of the Public Health Acts and by by-laws made under those Acts, have received special attention. The work may almost be described as an encyclopædia of the law relating to building, and should be valuable to both lawyers and laymen.

The Temple of Deir el Bahari. By EDOUARD NAVILLE. Part V. (London: Offices of the Egypt Exploration Fund.)

THE fifth part of Mr. Naville's series of publications on the temple of Deir el Bahari is almost entirely occupied with illustrations and comments on the wall-paintings, which belong more to Egyptian history generally than to architecture. One plate is devoted to plans and sections of the Upper Court and Sanctuary, the portion of the Temple the wall-paintings of which are illustrated in the remaining plates. A short description of this plate is furnished by Mr. C. R. Peers.

The large court had originally a double colonnade round it, of which only the bases of some of the columns remain. On the west side of the court is an entrance giving access to three narrow rock-cut chambers opening one out of another. Before this door-way is a porch projecting rather oddly into the middle of the courtyard; it is the same width as the intercolumniations of the colonnade, two of the columns of which have been more or less preserved by being encased between the walls of the porch, which are not as high as the columns, but have kept them standing, so that the general character of the colonnade can be inferred from these two examples. The colonnade and the surrounding walls of the court are of the XVIIIth dynasty; the porch is a Ptolemaic addition, rather awkwardly built in, apparently to give greater importance to the entrance to the three apartments beyond, the first and largest of which is of the same width as the porch and the intercolumniation. In the west wall, arranged symmetrically on each side of this porch, are nine niches, eighteen in all, of which four are deeper than the others, the deep and shallow ones alternating.

The first chamber has a barrel vault in horizontal courses, protected from stones falling from the cliff above by a pointed roof of flat stones inclined against each other at an angle of about 45 deg., the whole having a rough resemblance to the section of a vaulted cathedral with its sloping timber roof above. The second chamber has a flat ceiling and two little transept rooms north and south. The third chamber is a Ptolemaic addition, so that there was evidently an intention in the Ptolemaic period to emphasise the importance of this portion of the temple.

To the south of the main court, and entered from a small court preceding it, is a long narrow hall running east and west, which retains at the west end a portion of its original barrel vault, of the same construction as that of the first chamber in the centre.

It seems odd that, with all these data to go upon, no attempt should have been made at an architectural restoration of this portion of the temple; an attempt which would certainly not have been omitted in any French publication of the same kind.

BOOKS RECEIVED.

LONDON BUILDING ACTS (AMENDMENT) ACT, 1905. By Bernard C. Molloy, Barrister-at-Law. (The *Estates Gazette* Office. 5s.)

MODERN BUILDINGS: THEIR PLANNING AND CONSTRUCTION. Edited by G. A. T. Middleton, A.R.I.B.A. Vol. V. (The Caxton Publishing Company.)

Correspondence.

BOROUGH COUNCILS AND BY-LAWS.

SIR,—Can any of your readers inform me (1) whether there are any small borough councils or urban district councils in England which have not adopted building by-laws; (2) if any council or councils which formerly had building by-laws have rescinded them entirely with the sanction of the Local Government Board, or, having rescinded them, been allowed to adopt less stringent and more applicable by-laws?

Will any of your readers give the names of any councils to which the above queries refer?

I am seeking this information for a small borough town with a population of 3,000 which has adopted the Model By-laws of the Local Government Board applicable to urban districts, and the council of which are now anxious to alter, amend, or repeal them, because the present by-laws tend to stultify all building operations since adopted some ten years ago.

SURVEYOR.

ZODIACS IN VARIOUS CHURCHES.

SIR,—The following instances of zodiacs in churches are all that I know of besides those already mentioned :—

1. Painted in the Santa Catalina Sanctuary, or Pantheon, opening out of the Colegiata of San Isidore en Leon ; about XIIth century. (Lomas : "Sketches in Spain," 1888, p. 400.)

2. It has been said that there is a zodiac, sculptured in stone, outside S. Stephen's Cathedral, Vienna.

3. In a stained glass window, with the occupations of each month, in Mons Cathedral. (*Archæologia Cantiana*, iv.)

4. Worked in colours, in circles, along the centre of a long carpet, covering the middle of the sacrarium, leading to the high altar, in the new church in Catharinje-street, Utrecht.

5. In another church in Catharinje-street, Utrecht, on a square carpet, are Aquarius, Leo, etc.

6. Carved in two rows of circles, on the front of an ancient Icelandic armchair, of cornel wood, from Holum Cathedral (probably the episcopal throne). The sign names are in Runic and also in Latin. Now in Kongelige Museum, Copenhagen. (Stephens : "Runic Hall." Engraved in Worsae : "Afbildninger fra det Kongelige Museum.")

7. On the head of a tau-shaped episcopal staff of walrus ivory : XIIth century. In V. A. M., No. 215. A cast of it, in fictile ivory, 1865, is in the V. A. M., No. 112. It is engraved in Du Chaillu : "The Viking Age," 1889, II., 254. A photograph of it is in the V. A. M. collection, No. 3790.

8. It is stated that there is a zodiac in Kilpeck Church, on a doorway arch, Herefordshire. Engraved in *Country Life* : 1906. *Ante* 1124.

9. Dean Stanley seems to say there are signs on stones, in the pavement, outside Edward the Confessor's tomb, Westminster Abbey.

10. Also round the tomb of Henry III. ("Memorials of Westminster Abbey," 1904, p. 222.)

D. J.

The Student's Column.

ROOFS : STRUCTURALLY CONSIDERED.—XXIII.

21. *The Complete Design of a Timber Truss (concluded).*

THE last tie-beam and bracing joint is L_3 where either of the braces P_2 L_3 may have to carry the stress of 12,700, while the other is entirely free from stress according as the wind blows from the right hand or the left hand.

This joint can be made in several ways, some of which are described below.

Fig. 172 illustrates a simple method of connexion where the two braces are let into the tie-beam and held in place laterally by timber fish-plates secured by bolts and nuts.

A simple calculation shows that sufficient bearing surface can be secured to guard the toe of either brace and the fibres of the tie-beam against undue compression. The fish-plates may be of wood or steel as preferred, and having nothing to do beyond preventing accidental displacement of the braces need not be more than, say 1¼-in. thick for timber or ¼-in. thick for steel, and can be held in place by ¾-in. bolts and nuts with washers of the customary diameter.

As by Table XXXVIII., the stress in the 1½-in. king-tie is 16,100 lb., the bearing plate beneath the tie-beam must have sufficient area to limit compression against the grain to 350 lb. per square inch.

Hence we require $16{,}100 \div 350 = 46$ sq. in. The width of the tie-beam being 6 in., the length of the plate must be $46 \div 6 = 7{\cdot}6$, say 8 in. By calculation as in Articles XVIII. and XIX. it will be found that the plate should be ¾ in. thick.

Fig. 173 represents a better form of joint where a timber block is let into the tie-beam to the depth of 1 in. and held in place laterally by steel plates and ¾ in. diameter bolts and nuts, while the braces are kept in place by dowels. The braces here get a square bearing against the angle block, and another advantage is that the tie-bolt passes clear of them through the central block. As before, the king-tie requires a 6 in. by 8 in. bearing plate below the tie-beam.

Fig. 174 illustrates a cast-iron angle block let into the tie-beam, and providing a bearing surface perpendicular to the axis of each brace. The block can be kept in position laterally by the king-tie, or by outside ribs, or by a central block let into the tie-beam. As before, the king-tie requires a 6 in. by 8 in. plate below the tie-beam.

(*o.*) *Connexion of Purlins.*—No special treatment is necessary for attachment of the purlins except that in cases where the principal rafters are jointed as illustrated in Figs. 168 and 169, the ridge-plate must be replaced by two purlins, one at each side of the vertical centre line of the truss, and as two members are so employed they may be made thinner than those over joints P_1 and P_2.

(*p.*) *Wall Plate.*—The only detail remaining for consideration is the wall plate or bearing beneath the joint L_0.

As shown in Fig. 154, the vertical load is 23,500 lb., and to provide adequate resistance to compression against the grain of the timber the wall bearing or that portion of the wall plate beneath the tie-beam should have the area of $23{,}500 \div 350 = 67$ square inches.

The tie-beam being 6 in. wide, the width of the wall bearing ought to be

$$67 \div 6 = 11{\cdot}16 \text{ in.}$$

By Fig. 154 the horizontal component of the vertical load is 3,700 lb., and we must see that the wall-plate or bearing will be capable of resisting the tendency to lateral displacement due to this force.

Assuming the wall to be of brick, the bearing will probably be secure without any special provision for preventing horizontal movement, because friction between the timber and the brickwork is very considerable.

Referring to Table XLVI., we find the coefficient of friction for timber on stone to be $f = 0{\cdot}40$.

Then by rule (32) the total friction between the two materials will be

$$F = Pf.$$

In the present case we have P = 23,500 lb. Whence

$$F = 23{,}500 \times 0{\cdot}4 = 9{,}400 \text{ lb.}$$

which is about two and a half times the force to be withstood.

For a similar reason it is not absolutely necessary to notch or cog the tie-beam upon the wall-plate as represented in Figs. 130 and 131, p. 402, but for additional security it is better that this should be done.

(*q.*) *Quantities for the Complete Truss.*—Having now settled all details of the truss, we can next compute the exact weight, which in Article XVI., p. 514, was provisionally estimated at 3,240 lb.

Commencing with the timber members of the truss and taking them in the order adopted in preceding articles, we find the dimensions of the principal rafters were settled in *par.* (*e*), p. 574, at 6 in. by 8 in.

As indicated by Figs. 145 to 149, p. 435, the actual length of the principal rafters is not governed entirely by the span of the roof. In the present case, however, we will base the length on the span and pitch of the roof.

Then the length of each principal rafter is

$$\tfrac{1}{2}\,(60 \div \cos.\ 33° 40') = 36 \text{ ft.}$$

Adopting the cubic foot as the unit of measurement, we have

$$\frac{2\,(6 \times 8)}{144} \times 36 = 24 \text{ cub. ft.}$$

For the purpose of this and the following calculations, the weight of the timber will be taken at 47 lb. per cubic foot, giving for the weight of the two principal rafters

$$24 \times 47 = 1{,}128 \text{ lb.}$$

By *par.* (*f*), p. 575, we have two struts P_1 L_2 measuring 4 in. by 6 in., the approximate length being 12 ft.

These dimensions give

$$\frac{2\,(4 \times 6)}{144} \times 12 = 4 \text{ cub. ft.}$$

and

$$4 \times 47 = 188 \text{ lb.}$$

By the same paragraph the dimension of

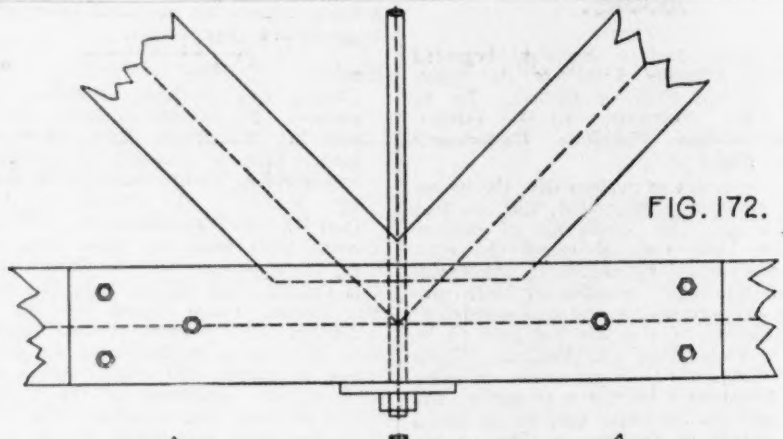

FIG. 172.

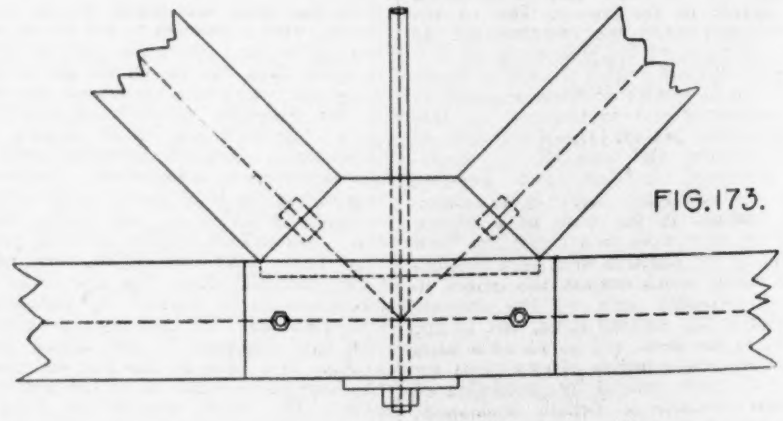

FIG. 173.

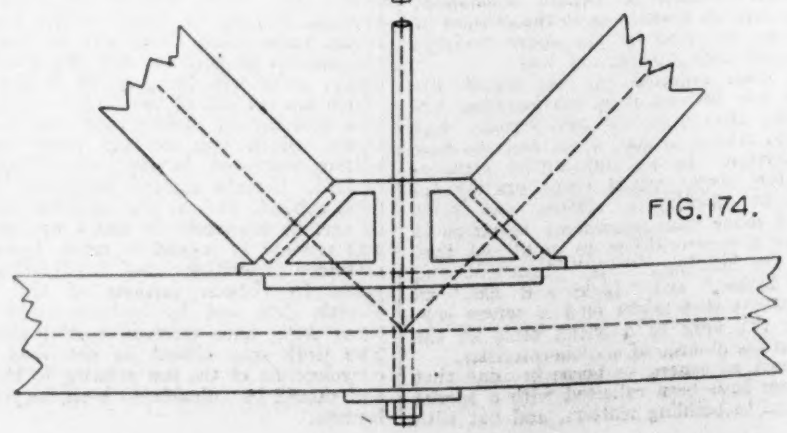

FIG. 174.

the two struts, P_2 L_3 were settled at 4 in. by 8 in., but in *par.* (*m*), p. 731, we found that to provide adequately for joint P_2 it would be necessary to increase the dimensions to 5 in. by 8 in., or 6 in. by 7 in., unless a bearing-plate or a cast-iron saddle were applied to the principal rafter.

In the present calculations we retain the original dimensions of 4 in. by 8 in., and adopt the cast-iron saddle for joint P_2.

Then the volume of the two struts, with the approximate length of 14 ft. each, will be

$$\frac{2\,(4 \times 8)}{144} \times 14 = 6{\cdot}22, \text{ say } 6{\cdot}25 \text{ cub. ft.}$$

and the weight will be

$$6{\cdot}25 \times 47 = 293{\cdot}75, \text{ say } 294 \text{ lb.}$$

By *par* (*g*), p. 575, the dimensions of the tie-beam are 6 in. by 8 in., and allowing for a projection of 13½ in. at each end beyond the intersection of the centre lines of the principal rafters and the tie-beam, the total length will be 32·25 ft.

This gives

$$\frac{(6 \times 8)}{144} \times 32 = 10{\cdot}75, \text{ say } 11 \text{ cub. ft.}$$

and

$$11 \times 47 = 517 \text{ lb.}$$

Turning to the steel vertical ties, we have two members P_1 L_1, with the diameter of ¾-in., and the approximate length of 8 ft. The sectional area of each bar is $0{\cdot}75^2 \frac{\pi}{4} = 0{\cdot}4418$ sq. in., and the volume of the two bars is

$$2 \times 0{\cdot}4418 \times 8 \times 12 = 84{\cdot}75, \text{ say } 85 \text{ cub. in.}$$

The mean weight of steel being about 490 lb. per cubic foot, or $490 \div 1{\cdot}728 = 0{\cdot}2835$ lb., the weight of the two ties is

$$85 \times 0{\cdot}2835 = 24{\cdot}1, \text{ say } 24{\cdot}25 \text{ lb.}$$

The two members P_2 L_2 with the diameter of ⅞-in. are approximately 14 ft. 6 in. long. The sectional area is $0{\cdot}875^2 \frac{\pi}{4} = 0{\cdot}601$ sq. in., and the volume is

$$2 \times 0{\cdot}6 \times 14{\cdot}5 \times 12 = 209, \text{ say } 210 \text{ cub. in.}$$

and the weight is

$$210 \times 0{\cdot}2835 = 59{\cdot}5 \text{ lb.}$$

The king-tie of 1⅜ in. diameter, with the corresponding area of 1·485 sq. in., is about 21 ft. long, and its volume is

$$1{\cdot}485 \times 21 \times 12 = 374, \text{ say } 375 \text{ cubic in.}$$

and the weight is

$$375 \times 0{\cdot}2835 = 106{\cdot}3, \text{ say } 106{\cdot}25 \text{ lb.}$$

The nuts required for the three sets of vertical ties are as follows:—

4	¾ in.	nuts for ties	P_1 L_1 at	0·25 = 1·00 lb.
4	⅞ in.	„ „	P_2 L_2 „	0·37 = 1·48 lb.
2	1⅜ in.	„ „	P_3 L_3 „	1·26 = 2·52 lb.
		Total		5·00 lb.

For each cast-iron shoe at joints L_0 (see Fig. 163, p. 665), two ¾ in. bolts 10 in. long are necessary, the weight of which with square heads is 1·83 lb. each, or 7·32, say, 7·5 lb. for the two sets.

Each saddle at joints P_1, generally represented in Fig. 167, p. 731, should be made with a projection let into the lower surface of the principal rafter, and the inclined brace should fit into a recessed part to keep it from slipping in a downward direction. One lag screw, say, ⅝ in. diameter by 6 in. long, will serve to hold the saddle in place, and the brace can be secured by a ⅝-in. diameter bolt and nut about 6 in. long passing through the sides of the saddle. Then for two such saddles we require two lag screws, weighing, say, 1·25 lb., and two bolts and nuts, weighing 1·75 lb.

For the similar saddles at joints P_2 we also require two lag screws and two bolts, weighing 1·25 lb. and 1·75 lb. respectively.

Each cast-iron shoe at joints L_2 (see Fig. 171) should be held in place by two ½ in. lag screws 6 in. long, and weighing, say, 2·5 lb. for the four.

The following washers are required for the various joints:

For the two shoes, as at L_0 (Fig. 163), four 3½ in. diameter cast-iron washers, weighing 5 lb.; for two ties, as P_1 L_1 (Fig. 171), two 3½ in. diameter cast-iron angle washers, weighing 5 lb., and two 3½ in. diameter cast-iron ordinary washers, weighing 2·5 lb.; for two ties as P_2 L_2, two 4½ in. diameter cast-iron angle washers, weighing 12 lb., and two 4½ in. diameter ordinary cast-iron washers, weighing 6 lb.

The tie P_3 L_3 requires a 6 in. by 8 in. bearing plate, ¾ in. thick, at joint L_3, the weight of which, neglecting the metal cut out for the bolt hole, will be

$$6 \times 8 \times 0{\cdot}75 \times 0{\cdot}2835 = 10{\cdot}2, \text{ say } 10 \text{ lb.}$$

Finally we have to estimate the weight of two cast-iron shoes for joints L_0, two saddles for joints P_1, two similar saddles for joints P_2, one angle block for joint P_3, two cast-iron shoes for joints L_2, and one angle block for joint L_3.

To avoid tedious calculations we will assume that the weights of the ten castings have been computed as below:

Two shoes	L_0	at 56 lb. =	112 lb.
Two saddles	P_1	at 14 lb. =	28 lb.
Two saddles	P_2	at 14 lb. =	28 lb.
One block	P_3	at 42 lb. =	42 lb.
Two shoes	L_2	at 14 lb. =	28 lb.
One block	L_3	at 42 lb. =	42 lb.
		Total	280 lb.

Summarising the various weights determined above, we obtain the total weight of the truss as given in Table XLVIII.

Comparing the weight ascertained with that provisionally assumed for the purposes of calculation, we find that an ample margin is left, which may be regarded as an addition to the general factor of safety.

TABLE XLVIII.—QUANTITIES FOR COMPLETE TRUSS.

Member.	No.	Dimensions. Transverse.	Dimensions. Longitudinal.	Cubic Feet.	Weight lb.	
		Timber. In.	Ft.			
Principal Rafter	2	6 × 8	36	24	1128	
Brace P_1 L_2	2	4 × 6	12	4	188	
Brace P_2 L_3	2	4 × 8	14	6⅔	294	
Tie-Beam	1	6 × 8	32	11	517	
						2127
		Steel.		Cubic in.		
Tie P_1 L_1	2	¾ in. dia.	8	85	24¼	
Tie P_2 L_2	2	⅞ „	14½	210	59½	
Tie P_3 L_3	1	1⅜ „	21	375	106¾	
Nuts	4	¾ „	—	—		
„	4	⅞ „	—	—		
„	2	1⅜ „	—	—		
Bolts and Nuts	4	¾ „	10	—	7½	
„	4	⅞ „	6	—	3½	
Lag Screws	6	⅝ „	6	—	3	
Bearing Plate	1	6 × 8	¾-in. thick.	—	14	
Washers for Ties P_1 L_1 and for sundry bolts, say	18	—	—	—	1½	22½
		Cast Iron.				
Ordinary Washers	6	3½ in. dia.	—	—	7½	
„ „	2	4½ „	—	—	6	
Angle „	2	3½ „	—	—	5	
„ „	2	4½ „	—	—	12	
Angle Blocks and Saddles	10	—	—	—	280	310½
			Total	Weight		2660

Obituary.

MR. STOCK.—The late Mr. Henry William Stock, District Surveyor for the Limehouse, Wapping, and St. Katharine district, who was appointed as a district surveyor in 1888, was a son of Mr. Henry Stock, of the firm of Messrs. Stock, Page, & Stock, of Denman-street, London Bridge, S.E., architects and surveyors. In March, 1906, Mr. Stock succeeded his father as Surveyor to the Haberdashers' Company, upon the resignation by Mr. Henry Stock of that appointment.

General Building News.

PRIORY CHURCH OF ST. MARY THE VIRGIN.—The second link in the large work of restoring the ruined Priory Church of St. Mary the Virgin, at Nuneaton, to religious uses was completed on St. Andrew's Day with the consecration of the new presbytery. This priory was founded by Robert, Earl of Leicester, in the reign of Henry II., for nuns of the order of Fontevrault, of which there were only two other houses in England. It was a branch of the Benedictines, and the larger houses were double ones containing monks as well as nuns. The church of Nuneaton consisted of a presbytery of two bays, transepts of two bays each, with a chapel to the east of the northern, a central tower, and a long, aisleless nave. The only entrance from without was by a large porch on the west side of the north transept. The presbytery and transepts were rebuilt in the XIIIth century, and covered by low vaulting in wide bays. Of this church the only remains are, besides the crossing piers which stand to their springers, the plinths of part of the north and south sides of the presbytery, the plinths of the east and west walls of the north transept with the lowest courses of the porch, the plinths of the east side of the south transept, with the south wall as high as the springer of the vault, and the north and west walls of the nave to varying heights. These ruins were, from the Suppression until 1876, in private hands, but in that year Mr. James Tomkinson gave them, with about three acres of land, to the newly-formed parish of St. Mary's, when about 50 ft. of the nave was rebuilt. Since then further church accommodation was required, and at a meeting of the parishioners three years ago it was agreed that another section of the completion of the church be taken in hand. Mr. Harold Brakspear, of Corsham, under whom the repairs at Malmesbury Abbey Church had just been completed, was entrusted with the work. The new presbytery is exactly on the lines of the old, 40 ft. in length by 29 ft. in width, and the remains of the deep-moulded plinth of the side walls are retained in position. The style adopted is a free treatment of the late XIIIth century work. The east end has a large five-light window, and the side walls four two-light windows in each. The altar is kept away from the east wall against a low screen. In the south wall is a piscina and sedilia arranged in continuous wall arcading, which is continued on the north side in the eastern bay. The east arch of the crossing, which was altered in the XIIIth century rebuilding, has been reinstated, and the responds repaired as little as possible consistently with sound work. Under the arch is the framework of a rood screen, to be finished as funds allow, surmounted by a great cross with carved bosses at the ends of the arms. The choir seats are at present placed inside the presbytery, but when the rest of the church is finished will occupy their original position under the crossing. The contract was gained in a limited competition by Mr. Henry Willcock, of Wolverhampton. The heating is an enlargement of a scheme already put into the rebuilt nave by Messrs. Wright Brothers, of Sheffield, and the small amount of carving there is has been executed by Mr. C. H. Palmer, of Bristol.

ROMAN CATHOLIC CHURCH, DORCHESTER.—The foundation-stone was recently laid by the Bishop of Plymouth of a new Roman Catholic church, which is being erected on a site in High West-street. The building will have a frontage to High West-street of 28 ft., and to Alington-street of 95 ft. It will accommodate about 260 persons. The exterior walling will have coursed rock-faced stone, with Bath stone dressings to windows and doors. The two fronts will be flanked with buttresses, the set-offs and water-tables being of stone. The High West-street front will be gabled and surmounted with a carved stone cross. A niche will be placed in the apex of the gable. All the windows have moulded labels and the openings glazed with leaded lights. The roofs will be covered with slate, with ornamental cresting on the ridge. The principal entrance will be approached by two steps, and, with the vestibule, the floors will be laid with Staffordshire tiles. The nave is shown 23 ft. by 57 ft., and the sanctuary 23 ft. by 21 ft. The floors will be laid with pitch-pine blocks on cement concrete, the sanctuary floor being raised one foot above the nave. The height of the nave to the wallplate is 20 ft. 6 in., and to the highest part of ceiling 29 ft. The roof is of steep pitch, and between the semi-circular principal the ceiling is of semi-octagonal form and panelled with boarding the whole length of building. On the east side is the sacristy, 14 ft. 6 in. by 13 ft. 6 in., with outer porch and Lady chapel. The interior walls will be finished with tinted stucco. The exposed timbers of the

roofs will be stained and varnished. Provision will be made for heating the building, the chamber being placed in the basement. The architects are the Very Rev. Canon Scoles and Mr. G. Raymond, of Basingstoke, and the contractors entrusted with the work are Messrs. J. W. & H. Childs, of the Kingston Works, Yeovil.

CONGREGATIONAL CHURCH, MANCHESTER.—The alterations in the Congregational Church, in Palatine-road have involved the re-arrangement of the entire choir. The high gallery, which contained the old organ and the seats for the choir, has been removed, and also the large wooden pulpit. In the new work the floor of the choir has been raised three steps above the level of the floor of the church. Upon this raised floor positions have been allocated for the choir stalls, the organ, and the proposed stone pulpit. The space for the Communion table has been placed in front of the choir and raised one step above the floor of the church. The organ has been erected against the east wall, ina central position, with a detached console in front. On both sides the stalls for the choir have been placed parallel to the side walls of the church. The pulpit will be erected shortly. It is the gift of Mr. Peter Eadie, jun., and will be a memorial to the late Mrs. Emilie Eadie. The organ-case, together with the choir stalls and canopies, has been executed in Sequoia. The whole of the work, including the case of the organ, has been carried out in accordance with the designs of Mr. John Swarbrick, architect, and under the direction and supervision of Messrs. J. & J. Swarbrick, architects to the Alterations and Organ Committee. The general contractors for the structural alterations were Messrs. Peace & Norquoy, of Manchester; the organ-case has been executed by the builder of the organ, Mr. J. J. Binns, of Leeds; while the traceried stone screen, the Verona red marble tiling of the Communion space, and the pulpit are the work of Messrs. Wm. Hilton & Sons, of Manchester. The wood carving has been executed by Messrs. J. Hallwood & Sons, and Mr. Wm. Cowen, both of Manchester. The latter carver has been engaged exclusively upon the wood carving of the organ-case.

BUCKFAST ABBEY.—One of the Benedictine monks of Buckfast Abbey, Buckfastleigh, is at present at the studios of Mr. Harry Hems, Exeter, where he is being taught the art of dressing stone. The monks have started to build an abbey and church on the old Cistercian foundations, at Buckfast, the probable cost of which amounts to between 30,000*l.* and 40,000*l.* The dressing and pointing of the stone will be done by the monks themselves, and the abbey authorities confidently expect that some of the fathers will be proficient enough in stone carving to do the more elaborate parts of the church, such as the altars. The building operations are in the hands of the monks themselves, under the direction of the abbey architect, Mr. F. A. Walters, of Westminster. The late abbot, Dom Boniface Natter, had almost completed the foundations of the new church when he met with such an untimely end in the wreck of the *Sirio*, off the Spanish coast last August. The rebuilding of the abbey church is intended as a memorial to the late abbot. It will be in purest Romanesque, and follow the lines of the building of the celebrated Fountains Abbey. The sanctuary will form more than half the actual church, and this portion is to be completed first. During the excavations of the Cistercian buildings many fragments of masonry, coloured tiles, stained glass, a leaden bulla of John XXII., pieces of carved stone from Early Norman to late Perpendicular, etc., were found. The height of the building will be, on the inside, 50 ft., and, with regard to the abbey, the old staircase, which is a feature in at least four of the old Cistercian abbeys, will be reproduced.—*Western Times.*

SCHOOL, CAERPHILLY.—The first new school erected at Caerphilly by the Glamorgan Education Committee was opened on the 7th inst. The school is designed on the central hall principle, with six classrooms, a cloakroom, and a head-teacher's room. In the basement there are playgrounds and a heating-chamber. The walls are built of local stone with Ruabon brick and box ground Bath stone dressings, the roofs being covered with Welsh slates. The school, which provides accommodation for 330 scholars, was designed and carried out under the supervision of the County Architect, Mr. D. Pugh-Jones, F.S.I., Cardiff, at a cost of 5,000*l.*, the contractor being Mr. T. F. Howells, of Cardiff, and the clerk of the works Mr. Thomas Jones.

MANCHESTER STOCK EXCHANGE.—The new Manchester Stock Exchange, bounded by Norfolk-street, New Brown-street, and Pall Mall, it now complete. The "House" is at the rear of the building with a main entrance on the level in Norfolk-street, and with vestibule and waiting and interview rooms in convenient proximity. The secondary entrance, with clerks' vestibule, is in Pall Mall. The "House" is directly under a dome supported by marble columns, and the walls are lined with marble and arcaded. Forty telephone boxes are arranged in sections, giving communication with all parts and the telegraph receiving and distributing centres, with pneumatic tube equipments, are close at hand. Special rooms have been so arranged that members may overlook the "House" and always be in call, while provision is made for the clerks in the "House" and clearing-room. The secretary and his staff have a suite of rooms near the entrance, readily accessible both to members and public. The building also includes a bank and suites of offices. The design is Renaissance in character. The lower part of the building with the entrances and arched windows is faced with light grey granite, and Portland stone facing has been used all round the upper part. The building is fireproof throughout. It has cost over 35,000*l.* The marble work has been executed by Messrs. Fenning & Co., Ltd., London; the fibrous plaster work, from the architects' designs, was by Messrs. J. B. Johnson & Co., Liverpool; the plastering, painting, etc., work has been carried out by Mr. C. E. Harwood, Strangeways, Manchester; the electric-passenger lift in the centre of the staircase is by Messrs. W. Sprowson & Co., Manchester; the heating and ventilating is the work of Messrs. Saunders & Taylor, Ltd., Manchester; the plumbing contract was carried out by Messrs. R. Heyworth & Co., Manchester; the iron and steel work was supplied by Messrs. E. Wood & Co., Ltd., Manchester; the wrought-iron work, from the architects' designs, was by Mr. T. Powers, Lower Broughton; and the British Luxfer Prism Syndicate, London and Manchester, supplied the prismatic dome light. The whole of the lower portion of the building has been carried out in "Grey Royal" granite, from the quarries of Messrs. Cooper, Wettern, & Co., Ltd., London. The architects were Messrs. Bradshaw & Gass, of Bolton. Illustrations of the building were given in our issue for July 9, 1904.

THE NEW GALLERIES FOR THE ROYAL SCOTTISH ACADEMY.—The National Galleries Bill has passed through Committee in the House of Commons. One effect of the Bill, says the *Scotsman*, is to set free the large back building at the Mound, at present occupied jointly by the National Gallery and the Royal Scottish Academy, for the purpose of a National Gallery. Internally this building will need a certain amount of reconstruction, especially at the south end, where the administrative offices of the Royal Scottish Academy are situated, but plans for this have not been gone into yet. The front building known as the Royal Institution will be allocated, in perpetuity, to the Royal Scottish Academy, who will find in it galleries, administrative offices, and a library of a much superior kind to what they have at present. A general sketch plan has been drawn up by Mr. Oldrieve, of the Board of Works, for the reconstruction of the interior of the Royal Institution building to fit it for the uses of the Royal Scottish Academy. Not a stone of the outside of the building will be touched. Internally, the present ground or street floor will be lowered 5 ft., and at this level, which will practically be that of Princes-street, the administravtie offices and library of the Academy will be situated. They will form a suite of rooms, well lighted from the present windows, and in all respects admirably adapted for the work of the Academy. Entering from the main doorway at the north end, there will be a grand staircase leading to the picture galleries above. At the Princes-street end, in connexion with this staircase, there will be cloak-rooms and a refreshment department. The present upper floor of the Royal Institution will be lowered 6 ft., so that galleries of a suitable height, well lighted from the top, will be formed. The idea is that from the top of the staircase there will be openings upon two small galleries, each half the width of the building; in turn, these will lead to a grand central gallery, the whole width of the house; and at the south end there will be two more galleries corresponding to those at the entrance. In these smaller galleries would be hung the water-colours, architectural drawings, etc. It is understood that in their new galleries the Royal Scottish Academy will have about twice as much wall space for the hanging of pictures as they possess at present. As to the "flitting" of the different bodies from the Royal Institution, so as to allow the architect to proceed with his alterations, it seems evident that some time must elapse before it can be accomplished.

Sanitary and Engineering News.

THE ROYAL EDWARD DOCK, BRISTOL.—A report has been prepared by Mr. W. W. Squire, the Bristol Docks Engineer, detailing the progress made with the works connected with the Royal Edward Dock during the three months ended November 30. From this it appears that the weather during September was favourable for work, but during October and November it was unfavourable. At the end of November the total amount of excavation from the site of the lock dock and graving dock amounted to 2,132,366 cubic yds. The dock walls are completed except the west wall, which is in progress. The walls of the entrance lock as far as the middle gates are completed to cope level. From the middle gates to the outer end of the lock they are within 8 ft. of cope level. The invert has been completed up to the middle gates, and the excavation for the remaining portion of the invert is in progress. The whole of the graving dock is completed except for a small portion of the coping at the nose end. The foundations of the engine and boiler house are in progress. The superstructure and filling of the south pier have been completed, and the superstructure of the north pier is completed except for a short length at the outer end. The remaining portion of the junction cut is well in hand. The riveting of the plating of both leaves of the lock gates has been completed, and testing is in progress. All the material for the middle gates, and nearly all the material for the outer gates have been delivered at Avonmouth. The machinery for the southern leaf of the inner lock gates has been partly erected, and all the details for the other machines have been completed in the contractors' yard. The erection of the sluice machinery at the junction cut is completed, and similar work is proceeding at the dock and graving dock. The capstans have been delivered, but none have yet been erected. With regard to the pumping machinery at the graving dock, the greater part of the principal castings have been made, and these are in the shops being machined. The suction pipes have been delivered. A large amount of detail work, including crank shafts, connecting rods, valve gearing, is also in the shops being machined. The principal castings for the condensing plant are also being made, and are being completed. The making of ferro-concrete piles for the foundation of the granary has been finished, and about half the piles had been driven at the end of November. The making of similar piles for No. 1 shed is in progress, and for the foundations of shed No. 3 all the timber piles have been driven, and some of the steel work has been delivered on the ground. The tender of the Motherwell Bridge Company has been accepted for the graving dock caisson, and that of Messrs. G. K. Stothert & Co. for the fairheads.

NEW WATERWORKS, FRODINGHAM.—On the 20th inst. the scheme which has been carried through at Frodingham to supply the townships of Brumby and Frodingham, forming the Urban District Council area with water, was opened for the public service. The scheme is by Mr. A. Atkinson, C.E., of Brigg, and is one for domestic purposes.

Foreign.

FRANCE.—The General Council of the Lower Seine Department has decided on the establishment of an asylum depôt at Grugny, at a cost of 862,000 francs.——A sum of 100,000 francs has been voted by the Municipal Council of Boulogne for works for the enlargement of the Town Museum.——The Department of "Assistance Publique" has opened a competition for a monument to the memory of members of the staff of hospitals and asylums who have fallen victims to their professional duties. The first premium has been awarded to M. Lebrun, architect.——It is proposed to demolish the prison of St. Lazare, at present a house of correction for female prisoners, and to build a new prison in the Javel district (XVth arrondissement).——A group of artists has been commissioned, under the direction of M. Dubufe, the painter, to decorate the Salle des Fêtes of Saint Mandé.——The Duchesse d'Uzès has been elected president, for three years, of the "Union des Femmes Peintres et Sculpteurs."——The death is announced, at the age of 28, of M. Didier Navarre, son of M. Edmond Navarre, member of the Société Centrale des Architectes. The young artist was a pupil of the Ecole des Beaux-Arts and of M. Marcel Lambert. A brilliant career had been expected for him, as he combined sound knowledge in drawing with imaginative faculty.——The death is also announced, at the age of 84, of the painter, Philippe Chaperon, who was the oldest of the theatrical decorative painters of Paris. He had much talent, and had executed some of the best decorations at the Opera, the Opera Comique, and the Comédie Française.

GERMANY.—Not only Germany but the whole civilised world was painfully astonished when the papers lately announced that Cologne Cathedral was so severely affected by the weather that its safety was feared for. Fortunately the report was exaggerated; but the damage so far as has been ascertained up to the present is of a serious nature when we consider that the cathedral, which took centuries to build, was only completed twenty-five years ago. From 1242, when the foundation-stone was laid, till the XVIth century the work was carried on spasmodically, the east end, the towers,

and part of the nave being built. Then, for three centuries the cathedral was not touched, the exposed portions being protected by weather-boarding only. In 1842 vigorous building operations were begun, which were completed in 1880, 26 million marks having been spent in this period on the work. In 1904 the choir foundations were found to be defective, and large stones began falling from the parapet and buttresses, since which extensive disintegration of stonework has been discovered on the west door, which will cost about 80,000 marks to repair, while the south door, barely forty years old, has begun to crumble. Here the limestone carving breaks away in the hand and finials rock if lightly touched, while the sandstone masonry is pitted with holes 10 cm. deep, and scales off in lengths of 2 ft. even where not exposed to rain. The repairs to this door alone will cost from 200,000 to 300,000 marks.——The Blitzbohner Society, Berlin, has patented a floor polisher whose brush is driven in a circular direction by electricity. A very light current is all that is necessary to drive the brush, and consequently it can be switched on to any electric light plug, and all the attendant has to do is to guide the brush by its handle over the surface to be polished.——The new Museum, Darmstadt, the work of Herr Alfred Messels, of Berlin, was opened last November. The tower, of light-coloured sandstone, stands out in fine contrast to the grey-tinted limestone of the main building.

SWITZERLAND.—On December 1 and 2 weight tests were applied to the new ferro-concrete bridge, Chippis. This bridge connects the large aluminium factory at Chippis, on the Rhone, with Sierre, and is the largest ferro-concrete bridge in Switzerland. It consists of two vast arches, 60 metres in the clear, from which the roadway is suspended. It was designed and constructed by Messrs. Froté, Westermann, & Co., of Zurich.——The revised building regulations of Zurich limit private houses to four stories in height besides the ground floor. If in addition the roof space be used as a fifth story, the regulation wall measurements must be increased by 20 cm. in thickness; the staircase must be fireproof and must have windows on every floor. If the roof space be used for dwelling-rooms these must not rise above the collar-beam, and must have plastered walls.

INDIA.—The Madras authorities are discussing whether the new harbour shall be constructed at Vizagapatam or at Bimlipatam. A new branch of railway, fifteen miles, will be built from Vizagapatam at a cost of Rs9,39,000.——The theory that rats carry the plague has led to them being exterminated wholesale throughout India. The old style of house being favourable to them, houses will be remodelled on modern principles. ——Practical sanitation is to be taught to Army medical officers at Rawal Pindi, Poona, Lucknow, and Bangalore.——A new dock scheme for Calcutta has been arranged by the Port Commissioners, and new jetties and warehouses are being built. Owing to the great expansion of Calcutta trade, additional accommodation in the near future will be still required.——The Government expenditure over the earthquake in April, 1905, in the Kangra district has been found to amount to Rs15,50,000, which was spent in temporary buildings and repairs, restoration, rebuilding, etc. Distribution of timber is not included in this amount.——A Victoria memorial fountain has been unveiled at Poona.——At Coimbatore the Victoria Hospital is being built, to which the Government has granted Rs60,000. At the same town the Gass Forest Museum has been opened, which is the first of its kind in the country.——A project for the construction of a bridge at Sara is under consideration.——The "Central Provinces Victoria Technical Institute" has been opened, at a cost of Rs1,50,000, to encourage economic studies, etc.——Smoke nuisances in Bengal are to be met by the Bengal Smoke Nuisance Act.

Miscellaneous.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS. —Mr. Albert E. Bullock, architect, has removed his offices from 5, John-street, Bedford-row, to 43, Chancery-lane, W.C.——Mr. E. Godfrey Page, architect, has removed his offices from 4 and 5, Warwick-court, Gray's-inn, to 2, Old Serjeants'-inn, Chancery-lane, E.C.——Messrs. Spalding & Spalding, architects, have removed their offices from 15, Queen-street, to 37 and 37, King-street, Cheapside, E.C. Their telephone number remains as before—"1167 Central."—— Mr. Henry N. Kerr, District Surveyor for St. James's, Westminster, has removed his office from Berwick House, 139, Oxford-street, to 13A, Great Marlborough-street, W.

INCORPORATED CHURCH BUILDING SOCIETY.— The Society held its usual monthly meeting on Thursday, the 20th inst., at 7, Dean's-yard, Westminster, the Rev. Canon C. F. Norman in the chair. Grants of money were made in aid of the following objects, viz.—Building new churches at Plumstead, St. Michael and All Angels, Kent, 200*l.* for the first portion, and Rushden, St. Peter, Northants, 130*l.* in lieu of a former grant of 100*l.*; towards rebuilding the Church of St. Mary, Highweek, near Newton Abbot, 130*l.* in lieu of a former grant of 85*l.*; and towards enlarging or otherwise improving the accommodation in the churches at Peterborough, St. John-the-Baptist, 50*l.*; Aberystwyth, St. Michael and All Angels, Cardiganshire, 100*l.* in lieu of a former grant of 60*l.*, and Astley, St. Peter, near Stourport, 65*l.* in lieu of a former grant of 40*l.* Grants were also made from the special Mission Buildings Fund towards building mission churches at Clerkenwell, St. Paul (Goswell-road), 10*l.*, and Picton, in the parish of Kirklevington, Yorks, 20*l.* The following grants were also paid for works completed:—Willesden, St. Matthew, Middlesex, 80*l.*, being balance of a grant of 100*l.*; Knaresdale Parish Church near Carlisle, 5*l.*; Slough, St. Paul, 200*l.*; Ilford, St. John, Essex, 100*l.*, making in all 250*l.*; Nuneaton, the Abbey Church of St. Mary-the-Virgin, 120*l.*; West Acton, St. Martin, Middlesex, 130*l.*; South Tottenham, St. Philip, Middlesex, 150*l.*; Belmont, near Durham, 10*l.*; Fellingon-Tyne, St. Oswald, 30*l.*; Swanley, Kent, 30*l.*; and Thornton-le-Clay, near Foston, Yorks, 10*l.* In addition to this the sum of 160*l.* was paid towards the repairs of twelve churches from trust funds held by the Society. The Society likewise accepted the trust of a sum of money as a repair fund for the Church of St. Barnabas, Walthamstow. A donation of 200*l.* has been promised by an old friend of the Society on condition that a further sum of 800*l.* is received without delay. The Committee earnestly appeal to all those who are interested in church building to contribute liberally to enable them to claim this conditional donation before the close of the present year.

THE BUILDING OF ASYLUMS.—On the 20th inst. the Royal Commission on the Care and Control of the Feeble-minded held its sixty-fourth sitting at Westminster, London. Mr. George T. Hine, Consulting Architect to the Commissioners in Lunacy, gave evidence with reference to the design and erection of asylums. If local authorities employed competent architects to draw their plans, he said, there would be no need to have an architect permanently on the staff of the Lunacy Commission. Country surveyors were not competent to undertake the design and erection of a building costing, say, 400,000*l.* Mr. Greene: You cannot expect a man who is extremely competent as a country surveyor to breathe the true spirit of the Renaissance or reach the higher flights of Gothic fancy? Witness declined to admit that the regulations issued by the Lunacy Commission were the cause of the erection of unduly expensive asylums. Some asylums on the Continent cost far more than those in England. It was not true economy to put up the least expensive building. For harmless imbeciles a great saving could be effected by adopting the cottage homes system. After hearing further evidence, the Commission adjourned.

CRYSTAL PALACE ENGINEERING SCHOOL.— The "Wilson Premium" for the best paper read before the Crystal Palace Engineering Society during the present session has been awarded by the Council to Mr. R. R. Yerburgh for his paper on "Timber." Other papers read during the session were "Reservoir Construction," by Mr. L. S. Layman; "Motors for Military Work," by Mr. F. A. Baker; and "Some Types of Rack Railway in Switzerland," by Mr. H. H. M. Spink. The premium was presented to Mr. Yerburgh by Lord Brassey, Associate of the Institution of Civil Engineers, on the occasion of the 102nd distribution of certificates at the above school, on Friday, December 21, at which he presided.

FRANCO-BRITISH EXHIBITION, 1908.—At a meeting held on December 17, of the executive Committee, the Duke of Argyll, honorary president, announced that the following appointments had been made:—Lord Derby, president of the Exhibition; principal architect, M. Tudoire, who designed the architectural court of the Esplanade des Invalides, Paris Exhibition, 1900; honorary consulting architect, Mr. Belcher; honorary consulting engineer, Sir Benjamin Baker; fine art commissioner, Sir Isidore Spielman; and chief executive officer, Mr. Imre Kiralfy. The ground, extending over some 100 acres on the east side of Wood-lane, near Uxbridge-road and Shepherd's-bush railway stations, is being laid out, and a further space of 42 acres has been added for the holding of the Olympic games and the erection of a pavilion and grand stand. The London County Council have approved of the plans, etc., for the more important buildings and the laying-out of the grounds.

SURVEY OF MEMORIALS OF GREATER LONDON.— Under the presidency of Lord Monkswell a general meeting of the committee was held on December 18 at Monkswell House, Chelsea-embankment. In the course of some remarks upon the contents of the report for the last two years, Mr. C. R. Ashbee, honorary chairman of the committee, expressed his belief that the survey of London would be completed within the next ten years provided that financial aid were forthcoming from some of the learned societies, and that the number of members of the working committee were raised to fifty. The making of the survey is carried out, gratuitously, by that committee, whilst current expenses, including the issue of publications, are cast upon the subscriptions of the honorary members. Mr. Ashbee's report, which will be considered at a subsequent meeting, contains recommendations and suggestions for establishing the work upon an improved basis and so largely increasing its scope, combining a general survey of London parishes and the publication of monographs descriptive of the more important buildings, for which the materials are supplied by the voluntary labours of the committee assisted by a permanent secretary, under Mr. Ashbee's general advisory assistance.

SALE OF STANDARD TOPOGRAPHICAL BOOKS.— The recent sale at Sotheby's of Mr. S. T. Fisher's library included the following works:—Hoare's "Ancient Wiltshire," and "The Modern History," 1812-44, ten volumes, 34*l.* (J. Bumpus); J. Kip's "Nouveau Théâtre de la Grande Bretagne," with supplement, 1724-8, a large copy, 41*l.* (Batsford); Blomefield's "Norfolk," continued by C. Parkin, 1769-75, 30*l.* (Quaritch); Hasted's "Kent," 1778, 17*l.* (Rimell); Dallaway's "Western Division of Sussex," comprising the Rapes of Chichester, 1815; Bramber, 1830; and Arundel, with Cartwright's additions, 1832, to the last-named section, 1819, whereof nearly all the impressions were destroyed by a fire, 36*l.* (Groves); Fenton's "Pembrokeshire," 1810, on large paper, 10*l.* 5*s.* (Young); and seventy-five volumes of the *Archæologia*, 1770-1905, 16*l.* (Quaritch).

Legal.

THE STRAND BUILDING DISPUTE.

The case of Lorden *v.* Draper and another came before Mr. Justice Neville, in the Chancery Division, on the 21st inst., on a motion by the plaintiff to restrain the defendants from trespassing on his premises, No. 421, Strand, W.C., and from further proceeding with the erection of a party wall except in accordance with the provisions of the London Building Act.

Mr. Jenkins, K.C., said that Mr. Lorden was in possession under a building agreement of the site of No. 421, Strand, which he had cleared and would in due course be erecting buildings on. Mr. Draper was the owner of the adjoining premises, No. 422. There was a party wall between the two premises which had become dangerous. Mr. Draper said that was due to something the plaintiff had done, and brought an action against him, which was pending. The wall was condemned by a magistrate's order, and had been taken down by Mr. Draper. Since then Mr. Draper had proceeded to make excavations in plaintiff's land, and not only to do that but also to put in concrete footings. Mr. Lorden now wanted to restrain him from further trespassing. Mr. Draper's solicitor had written offering an undertaking not to commit any further acts (he did not admit the trespass) pending the hearing of Mr. Draper's action; but what Mr. Lorden wanted was to restrain him during the pendency of his (Mr. Lorden's) action.

Mr. Macnaghten, K.C., said he could not give that undertaking.

Mr. Jenkins said he must in that case ask for the injunction. The point on the second branch of the case was the rebuilding of the wall. Mr. Draper said he was not rebuilding but merely strengthening. As Mr. Lorden was building a new block of buildings on his site it was essential to him that the party wall should be rebuilt in accordance with his requirements.

Mr. Macnaghten said what was done was a work of necessity to preserve what was left of the wall. He would prefer an injunction rather than give any undertaking as he had the London County Council against him as well as the plaintiff.

His lordship said he thought the injunction ought to be to restrain Mr. Draper from trespassing except for the purpose of maintaining the security of the wall, and he would limit the injunction in that way. The costs would be costs in the action.

EMPLOYER'S SUCCESSFUL PLEA OF WORKMAN'S SERIOUS AND WILFUL MISCONDUCT.

THE case of Brooker *v.* Warren came before the Court of Appeal, consisting of the Master of the Rolls and Lords Justices Cozens-Hardy and Farwell, on the 20th inst., on the appeal of the respondent, a timber merchant, from an award made by the judge of the Cheltenham County Court in favour of the widow of a deceased workman under the provisions of the Workmen's Compensation Act, 1897.

The short facts were these:—On January 10 last the deceased, who was employed by the

appellant, was engaged with a man named Timbrell in sawing up deals at a circular saw which was driven by machinery. The saw was then adequately protected by a guard, and the deceased was told by his employer that he was to be sure and keep the guard on while using the saw. In the afternoon of January 10 the deceased man had occasion to change the saw so as to be able to split larch poles, and he intentionally omitted to replace the guard over the saw. The object of the guard was to prevent timber which had jerked up from being caught by the teeth at the back of the saw and being thrown about the workshop to the common danger. The deceased was in the act of splitting a small piece of larch pole, and his duty was to start the sawing at the thin end of the pole and not to let go his hold until the pole was nearly sawn through, it being Timbrell's duty to receive the split ends of the pole on the other side of the saw, and to draw the pole on against the saw until completely cut through. For some reason the deceased man applied the thick instead of the thin end of the pole, and let it go before Timbrell had a firm hold at the other end. When the pole was nearly split through something caused the pole to jerk up and down, hurting Timbrells' knuckles against the bench, causing him to let go the pole. The result was that the pole jumped on to the top of the saw and shot backwards, striking the deceased and inflicting the injury from which he died. The only question in the case was whether the injury to the deceased was attributable to his serious and wilful misconduct within the meaning of sect. 1, sub-sect. 2, of the Act so as to disentitle his widow to compensation. The learned County Court judge decided that the deceased man's omission to replace the guard on the day of the accident did not, having regard to his findings of fact in the case, amount to serious and wilful misconduct, and he made, as before stated, an award in favour of the applicant.

Mr. Ruegg, K.C., and Mr. Wethered appeared for the appellant, and Mr. Maddocks in support of the award of the learned County Court judge.

At the conclusion of the arguments of counsel the Master of the Rolls, in giving judgment, said that in his opinion the only and inevitable conclusion from the evidence and the findings of fact was that the injury to the deceased was attributable to his serious and wilful misconduct. The deceased man knew of the orders given to him on many occasions both by the factory inspector and by his employer to use the guard when working the saw, and he deliberately refrained from using the guard. He was guilty of misconduct in deliberately and intentionally refusing to obey the order to use the guard, and the misconduct was wilful, and that misconduct was serious because it produced a condition of danger to himself and others. He was, therefore, guilty of serious and wilful misconduct. The only reason suggested by the County Court judge for arriving at the contrary conclusion was that owing to the state of the deceased man's mind his wilful disobedience did not amount to serious misconduct, though it might be so in the case of other people. In his lordship's opinion the deceased was fully aware of the order and of its importance, and he deliberately refused to obey it. It was his duty to obey it, and it was a very serious matter not to have done so on account of the danger likely to be caused thereby to himself and to others. It seemed to him to be a clear case of serious and wilful misconduct. Indeed he could hardly imagine a case of more serious and wilful misconduct. He thought that judgment ought to be entered for the appellant.

The Lords Justices concurred.

CLAIM UNDER WORKMEN'S COMPENSATION ACT.

THE case of Groom *v.* The Stanton Iron Works Company came before the Court of Appeal, consisting of the Master of the Rolls and Lords Justices Cozens-Hardy and Farwell, last week, on the appeal of the applicant, the widow of a deceased workman, against the refusal of the Ilkeston County Court judge to award her compensation in respect of the loss of her husband, who met with his death in the course of his employment with the respondents, who have extensive works in Derbyshire. In addition to their works proper the respondents had on their ground workmen's cottages, a church, and a public-house, while parts of the land were given up to garden allotments. The deceased workman was a bricklayer in the respondents' employ, and when he met with his death he was engaged in demolishing an old building which had been used as a workman's cottage. It was situated about 200 yds. from the place where the work of the factory was carried on. In these circumstances the County Court judge held that the claim of the widow did not come within the provisions of the Workmen's Compensation Act, as in his opinion the accident occurred too far away from the factory for him to hold that it took place "in, on or about a factory." Hence the present appeal in support of which it was argued that the whole of the area occupied by the respondents constituted a factory.

Mr. W. H. Stevenson, for the appellant, contended that the learned County Court judge had not applied the proper test to the question as to whether the accident occurred "in, on or about" a factory within the meaning of the Act. The reason given by the learned judge for holding as he had clearly showed that he did not appreciate what he really had to decide. He had based his finding solely upon the point that the place where the accident happened was much too far distant from the factory. He submitted that distance was clearly not the test, because if it were the legislature would have laid down some guiding principle on the matter. The question the learned County Court judge should have considered was whether the man's employment was not habitually about a factory, and whether his employment at the time of the accident was not really and substantially "in, on or about" a factory. He submitted that under the Factories Act the accident occurred on part of the close or curtilage of the factory within the definition given in that Act.

The Master of the Rolls, in giving judgment, said it was quite clear that the actual work the man was engaged upon was not work which brought him within the provisions of the Workmen's Compensation Act, and into the condition of working on a factory. The building he was dealing with did not constitute a factory of itself. It was said that within a short distance of the work he was actually engaged upon there was a factory belonging to the same persons who employed him to demolish this old building. The facts had only to be stated to show that the case did not fall inside but outside the Act. Proceeding, his lordship said he had dealt with the word "about" in the Act several times in the course of the last five or six years; he had been engaged in considering cases under the Act, and he thought it was perfectly clear now that the word "about" did unquestionably contain the notion of physical contiguity, but it also contained a reference to the nature of the work upon which the person was engaged. It must not only be physically contiguous to the factory, but it must have relation to the business of the factory. Those two conditions must be combined if the person was to be held to be employed about a "factory" as defined by the Act. Neither of the conditions involved in the word "about" was fulfilled by the claimant in this case. The work of pulling down the old property had nothing whatever to do with the factory, and the learned County Court judge had held that there was a physical proximity within the meaning of the principle applicable to the Act. So far from seeing the slightest indication of any misapprehension on the part of the learned judge as to the legal standard applicable to the case, his lordship thought it was obvious from the terms of the findings of the learned County Court judge that he had addressed himself to the true point and applied the right standard. For these reasons he thought the appeal should be dismissed with costs.

The Lords Justices concurred.

MARGATE BUILDING DISPUTE.

THE case of Margetson *v.* Beedell and another came before a Divisional Court of King's Bench, consisting of Justices Darling and Bray, last week, on the plaintiff's appeal from a judgment of the judge sitting at the Margate County Court.

In this case the plaintiff sought an injunction to prevent an alleged breach of building covenants regulating the conditions under which certain building plots in the Madeira-road, Margate, should be built upon. It appeared that the plaintiff was the owner of a plot on the Cliftonville Estate, the defendants being the owners of adjoining plots, and the matter complained of was the erection of a hoarding 41 ft. long and 18 ft. high bounding the defendants' plots. Plaintiff complained that this obstructed his light and constituted a breach of the covenants. The County Court judge holding that the erection was not a breach of the covenants, he entered judgment for the defendants. Hence the present appeal of the plaintiff.

Mr. Clavell Salter, K.C., and Mr. Young appeared for the appellant, and Mr. Montague Lush, K.C., Mr. F. Lowe, K.C., and Mr. S. Cooper, for the respondents on the appeal.

At the conclusion of the arguments of counsel on behalf of the appellant, and without calling upon counsel for the respondents, their lordships affirmed the decision of the learned County Court judge, and dismissed the appeal with costs.

A TEMPORARY WOODEN STRUCTURE.

An interesting test case affecting surveyors' fees was heard in the Guildhall Police Court on the 20th inst. Mr. Hills, District Surveyor for the eastern division of the City, claimed 15*s.* from the London and India Docks Company, for surveying a "structure" in Leadenhall-street. The "structure" was a temporary wooden staging erected at the company's offices from which a private party of thirty persons viewed the Lord Mayor's Show.

"Supposing," said Mr. A. F. Wootten, defending, "that instead of erecting a stand we had pushed the kitchen-dresser up to the window and used the housemaid's steps as a means of getting on to it—would you have considered yourself entitled to come in and survey?"

"I should not claim that, because I should not consider in that case that you had erected a structure," replied the surveyor.

Pressed as to what he considered a structure under the London Building Act, the witness said it was merely a question of fact, of which he was the judge. In the case of a number of desks pushed up to a window and planks bolted on them he should claim a right to survey.

"Supposing," observed the magistrate, Alderman Sir Horatio Davies, "I erected a ballroom in my back garden, and invited my friends to come to a dance there, would you suggest that you were entitled to come into my house and examine that?"

"I am afraid I should," admitted the surveyor. He maintained that he had the right to enter private houses even when he had received no notice of any work going on.

"And if you found no work in hand, how would you justify your presence?"

"I couldn't do it then, but I think the powers to enter are very wide."

The summons was dismissed with costs against the surveyor, but the magistrate consented to state a case.—*Daily Chronicle.*

Patents of the Week.

APPLICATIONS PUBLISHED.*

27,229 of 1905.—D. BEARDS, E. BEARDS, D. BEARDS, JUNR., A. C. BEARDS, and F. COPE: *Night Latches.*

THIS relates to a night latch in which a bolt is moved back by the key through the medium of a lever which is carried by the bolt, a slotted connexion being formed between the bolt and lever to admit of the bolt being moved back by the knob or handle, and a stop fixed within the case which prevents the lever being moved back by the key until it has been properly raised thereby.

2,948 of 1906.—H. BROOK: *Hangers for Gates and the like.*

This relates to hangers for gates and the like, and consists of a pin or stud having an elongated slot therein in which is adapted to register a bolt or the like inserted through openings in the metal strap or yoke to secure the latter to the pin or stud and adjustable in said slot by means of packing inserted therein or between the stud and any equivalent pin to reinstate the gate or door in the correct perpendicular position.

4,805 of 1906.—C. FENN: *Chimney top.*

This relates to a chimney top having means for facilitating the up-draught of the flue, and consists in constructing the same similar to an ordinary cylindrical square or other convenient shape top, and then forming around the surface of the same at four or other convenient number of points well up the chimney-top, holes each of which is provided with a cover which gradually widens towards the bottom of the chimney top. These covers are preferably arranged so that at their lower extremities their side edges practically meet around the surface of the chimney top approximately at the bottom of the same. From this point they taper up to the holes. The lower ends of the covers of the holes are left open so that they form funnels to the holes. The covers are each further provided with a slit or opening along their faces, and widen out into the opening at the lower end of the cover. This slit or opening in the face of each cover extends more than half-way up the said cover, leaving the part over the hole still intact, the chimney top or pot is then finished with a member provided with louvres.

6,902 of 1906.—W. H. FISHER: *Molding presses.*

This relates to a molding press, and consists of a vertically movable platen adapted to receive a wheeled truck carrying the mold box, in combination with crickets projecting through openings in the platen, said crickets normally engaging the wheels of the truck for supporting the body of the steam by the platen, but allowing the wheels to project into the openings, and the body of the truck, thereby raised on the platen when the platen is raised.

10,696 of 1906.—T. I. ROBERTS: *Locks for doors and the like.*

This relates to locks for doors and the like, and consists of rods passing up and down from the

* All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

PATENTS,—*Continued on page 761.*

List of Competitions, Contracts, etc.

For some Contracts still open, but not included in this List, see previous issues. Those with an asterisk (*) are advertised in this Number: Competitions, —; Contracts, iv. vi. viii. x. Public Appointment, xvi.; Auction Sales, xxiv.

Certain conditions, beyond those given in the following information, are imposed in some cases, such as: the advertisers do not bind themselves to accept the lowest or any tender; that a fair wages clause shall be observed; that no allowance will be made for tenders; and that deposits are returned on receipt of a bonâ-fide tender unless stated to the contrary.

Competitions.

JANUARY 31.—**Sunderland.**—LIBRARIES.—Sunderland Corporation invite competitive designs from architects practising in the borough for branch libraries to be erected in Church-street North and Villette-road. Premiums of 20*l.* and 10*l.* are offered for the first and second designs for each of the two libraries. Instructions to competitors and lithographed plans of the sites may be obtained from Mr. John W. Moncur, Assoc.M.Inst.C.E., Borough Engineer, Town Hall. Designs are to be delivered, free of cost, at the office of the Borough Engineer, Town Hall, before 12 o'clock at noon on January 31.

FEBRUARY 6.—**Galway.**—HOSPITAL.—Galway Board of Guardians invite plans and estimates of a fever hospital proposed to be erected at Galway. A premium of 25*l.* will be given; but in the event of the Guardians deciding to give the supervision of the building to the architect or engineer whose plan has been accepted, this premium will be merged in his fees. The selection will be made by an architect or engineer having no interest in the business. Particulars as to hospital accommodation, etc., required, will be furnished by Mr. Robt. F. Mullery, Clerk of Union, Galway. The plans will be received up to 11 o'clock a.m. on February 6.

MARCH 3.—**Castleford.**—SCHOOL.—The Governors of Castleford Secondary Schools invite competitive designs from architects practising in the West Riding of Yorkshire for a dual secondary school, etc., for 300 scholars, on a site in Healdfield-road, Castleford, and offer premiums of £50 and £25 respectively for the designs placed first and second by the assessor, Mr. Walter H. Brierley, F.S.A., F.R.I.B.A., architect, York, whose decision is to be final. Printed conditions and instructions (ready about January 1), together with a plan of the site, can be obtained on written application to Mr. Alfred Wilson, Clerk to the Governors, Station-road, Castleford, accompanied by a stamped addressed brief envelope, and a deposit of 10*s.* 6*d.* Designs are to be delivered on or before noon on March 3.

Contracts.

BUILDING.

DECEMBER 31.—**Ballycastle.**—COTTAGES.—Ballycastle R.D.C. invite tenders for the erection of cottages in the following Townlands, *i.e.*:—Park, Turnarobert, Aghrunneaght, Breen, Cloughcorr, Ballintoy, Whitehall, Townparks, Prolusk, Ballycleagh, Mazes, Lisnagat, Carnkirk, Broughanlea, East Torr, Drumawillin, Coolkenny, Moyarget Upp'r. The deposited maps and the plans, specifications, and draft contract may be inspected in the office of the Clerk of the Council. Tenders must be upon the prescribed form (which can be obtained at the office) and must be sealed and addressed to the presiding Chairman, Ballycastle R.D.C., and marked "Tender for Cottages," and must be received by Mr. Hugh M'Gill, Clerk of the Ballycastle R.D.C., Boardroom, Ballycastle, not later than 3 o'clock p.m. on December 31.

DECEMBER 31.—**Duloe.**—READING-ROOM.—For erecting reading-room at Duloe. For specifications apply to Mr. Nutcher, Tredinnick, Duloe. All tenders to be sent to Mr. Nutcher by December 31.

DECEMBER 31.—**Frizinghall.**—CARPENTERS AND JOINERS' WORK.—Bradford Corporation invite tenders for carpenters and joiners' work required to be done in repairs and reinstatement after fire at Dumb Mill, Frizinghall. Drawings and general conditions of contract may be seen, and bill of quantities and form of tender obtained, on application to the City Architect, Whitaker-buildings, Bradford. Sealed and endorsed tenders must be sent to Mr. Frederick Stevens, Town Clerk, Town Hall, Bradford, not later than 12 o'clock noon on December 31.

DECEMBER 31.—**Thirsk.**—CATTLE MART.—The erection of new cattle mart, Thirsk, for the Thirsk Farmers' Auction Mart Company, Ltd. Plans and general conditions and all information at offices of Mr. W. Hargreaves Bourne, A.R.I.B.A., architect, Darlington. Bills of quantities will be supplied to those who apply before December 31.

JANUARY 3.—**Lumphanan.**—COTTAGE.—Estimates wanted for the mason, carpenter, slater, and plaster works of new cottage at Mitchelley, Coull, Lumphanan (Lewis Burnett, tenant). Plans and specifications may be seen with the tenant. Offers will be received by Messrs. Cochran & Macpherson, advocates, 152, Union-street, Aberdeen, up to January 3.

JANUARY 3.—**Sale.**—UNDERGROUND CONVENIENCE.—Sale U.D.C. invite tenders for the erection of an underground convenience, at the junction of School-road and Chapel-road. Plans and general conditions may be seen, and bill of quantities obtained, on application to Mr. W. Holt, Engineer and Surveyor to the Council, on deposit of 1*l.* Sealed tenders, endorsed "Underground Convenience," to be delivered into the hands of Mr. D. Hallewell, Clerk to the Council, Council Offices, not later than 4 p.m. on January 3.

JANUARY 3.—**Whitby.**—RAISING FLOOR.—The Rector and Churchwardens of St. John's Church invite tenders for the raising of the choir floor, etc., at St. John's Church, according to plans and specifications which may be seen at the offices of Messrs. Woodwark & White, 53, Baxtergate, Whitby, where tenders, sealed and endorsed, are to be delivered not later than noon on January 3.

* JANUARY 4.—**Catford.**—SORTING OFFICE.—The Commissioners of H.M. Office of Works, etc., invite tenders for enlargement of the sorting office at Catford, S.E. Drawings, specifications, may be seen on application to Mr. J. Wayer, H.M. Office of Works, S.W. Bills of quantities and forms of tender may be obtained from the Secretary, H.M. Office of Works, Storey's Gate, S.W., to whom tenders, endorsed "Tender for Catford Sorting Office Enlargement," must be delivered not later than 12 noon, January 4.

JANUARY 5.—**Dutton.**—NURSES' HOME.—Runcorn Guardians invite tenders for the erection of a nurses' home, at Dutton Workhouse, and the alteration of certain existing buildings. Applications for specification and quantities, accompanied by a deposit of 3*l.* 3*s.*, to be made at office of Mr. Geo. F. Ashton, Clerk to the Guardians, 71, High-street, Runcorn, before January 5 next. Plans may be inspected at the office of Messrs. W. & S. Owen, architects, Warrington.

JANUARY 5.—**Tempo.**—TOWER AND SPIRE.—A tower and spire to the Catholic Church, Tempo, Co. Fermanagh, for the Rev. T. S. O'Neill, P.P. Plans and specification may be seen at the Parochial House, Tempo, Enniskillen, or at the offices of the architect, Mr. J. V. Brennan, C.E., Belfast Bank-chambers, Belfast, to whom sealed and endorsed tenders are to be delivered not later than January 5.

JANUARY 7.—**Hornchurch.**—FIRE STATION.—Hornchurch Parish Council invite tenders for the erection and completion of a fire station, with works incidental thereto, in Billet-lane, Hornchurch. The plans and specification may be seen, and forms of tender obtained, at the office of the architect, Mr. E. J. Little, Longfield-gardens, Hornchurch-road, Romford. Sealed tenders, endorsed "Tender for Fire Station," are to be sent to Mr. R. G. Ward, Chairman, Hornchurch Parish Council, Hornchurch, not later than 12 o'clock (noon) on January 7.

JANUARY 8.—**Shirley.**—HOUSE.—Southampton Corporation invite tenders for the erection of stabling accommodation at Clock House, Shirley. Plans, etc., may be seen, and bills of quantities and forms of tender obtained, at the Borough Engineer's Office, upon production of the Borough Treasurer's receipt for a deposit of 3*l.* 3*s.* Tenders, on the printed form, and endorsed "Tender, Clock House Stables," must be left at the Town Clerk's Office before 2 p.m. on January 8.

JANUARY 9.—**Landport.**—STORE.—For building a store at the Factory of Doudney and Co., Ltd., soap manufacturers, Landport. Specification, plans, and quantities to be seen at the office of the architects, Messrs. Cook & Tutte, 394, Commercial-road. Sealed tenders to be sent by January 9 to 333, Commercial-road, the registered offices of Doudney & Co., Ltd. Mr. C. White, Secretary.

JANUARY 10.—**Stewarton.**—CEMETERY.—Estimates wanted for (1) digger, brick, and mason works in one contract; (2) carpenter and joiner works; (3) slater and plumber works in connexion with keeper's house, etc.; (4) plaster, cement, and rough cast works; and (5) drainage, levelling, and road-making. Plans and specifications may be seen at the Parish Council Office, Stewarton, or at the office of Messrs. J. & J. Armour, architects, Irvine. Schedules of measurement can be obtained from the architects on the deposit of 1*l.* sterling. Sealed offers, marked "Offer for Cemetery," to be lodged with Mr. James Kerr, F.S.A.A., Clerk to the Parish Council, Parish Council Office, Stewarton, on or before January 10.

JANUARY 12.—**Banbury.**—ALTERATIONS AND REPAIRS.—The Trustees of the Bridge Estate Charity invite tenders for certain alterations and repairs at Nos. 1—4, Cherwell-terrace, Banbury. Specifications and plans can be seen, and information obtained, on application at office of Messrs. Fortescue & Sons, Clerks to the Trustees, 45, High-street, Banbury. Sealed tenders, endorsed "Bridge Estate Charity, Cherwell-terrace," to be delivered at their office not later than 1 o'clock p.m. on January 12.

JANUARY 12.—**Templepatrick.**—ALTERATIONS, ETC., TO MANSE.—Alterations and additions to Manse, Lylehill, Templepatrick. Plans and specifications may be seen at the offic of Mr. W. D. R. Taggart, 2, Wellington-place, Belfast. Tenders to be lodged before 12 o'clock noon on January 12.

* JANUARY 15.—**Tottenham.**—UNDERGROUND CONVENIENCE.—The Tottenham U.D.C. invite tenders for the erection of an underground convenience at High Cross, Tottenham. Plans can be seen, and conditions, specifications, bills of quantities, schedule of prices, and form of tender can be obtained, from the Engineer to the Council, Council Office, The Green, Tottenham, during office hours. Sealed tenders, on form supplied endorsed "Tender for Underground Convenience, High Cross, to be delivered to the Clerk to the Council by 12 o'clock noon, January 15.

JANUARY 18.—**Wallsend.**—POLICE BUILDINGS.—Northumberland Standing Joint Committee invite tenders for the whole of the works required in the erection of police buildings, Wallsend. Names to Mr. J. A. Bean, County Architect, The Moot Hall, Newcastle-on-Tyne. Bills of quantities will be forwarded on payment of a deposit of 2*l.* 2*s.* Sealed tenders, sent in the envelopes provided, to be delivered not later than 4 p.m. on January 18.

JANUARY 28.—**Kirton.**—OUT-OFFICES.—Kirton Council School Managers invite tenders for the erection of out-offices at the Church End Council Schools, Kirton, near Boston. Plans, etc., upon application to the architect (Mr. James Rowell, Church-lane, Boston). Tenders, endorsed "Tender for Out-offices," to reach Mr. J. H. Tooley, Clerk to the Managers, 6, Bridge-street, Boston, not later than January 8.

NO DATE.—**Bournemouth.**—REPAIRS, ETC.—Repairs and decorations at East Cliff Congregational Church. Names to Messrs. Lawson & Reynolds, architects, Yelverton-road.

NO DATE.—**Newcastle.**—BUSINESS PREMISES.—New business premises in New Bridge-street, Newcastle, for Mr. Charles Kirk. On the deposit of 1*l.* 1*s.* quantities may be obtained from Mr. J. J. Hill, M.S.A., architect, Bank-chambers, Shields-road, Newcastle-on-Tyne.

NO DATE.—**Wakefield.**—WAREHOUSE.—The erection of warehouse, offices, cottages, stabling, etc., Peterson-road and Micklethwaite-street, for Messrs. R. S. Dyson and Co., Ltd., wholesale provision merchants. Further particulars to Messrs. Simpson & Firth, architects and surveyors, Southgate, Wakefield.

ENGINEERING, IRON, AND STEEL.

DECEMBER 29.—**Okehampton.**—SCARIFIER.—The R.D.C. of Okehampton invite tenders for providing and fixing a scarifier to one of their steam road rollers. Tenders, quoting the kind of scarifier recommended and the price, including fixing (separately), to be sent to Mr. S. Hawker, Clerk to the Council, Okehampton, by 10 a.m. on December 29.

JANUARY 1.—**Fulham.**—LAUNDRY MACHINE.—Fulham Guardians invite tenders for supplying and fixing in the workhouse laundry a 108-in. ironing, drying, and finishing machine. Persons desirous of tendering must prepare and supply a specification thereof, and also of the necessary work in connexion with the fixing, which will include the provision of any necessary supports. Further particulars can be obtained at the Workhouse, upon application to the Engineer. Tenders, upon forms to be obtained upon application at office of Mr. E. J. Mott, Clerk to the Guardians, Guardians' Offices, 129, Fulham Palace-road, Hammersmith, and specifications, to be delivered not later than 2 o'clock p.m. on January 1.

JANUARY 7.—**Elgin.**—HOSPITAL ADDITIONS.—The mason, carpenter, plumber, slater, plaster, painter, and iron works of additions and alterations at Gray's Hospital, Elgin. The plans and specifications may be seen with Mr. John Wittet, architect, Elgin, from whom schedules may be obtained on receipt of a deposit of 10*s.* Endorsed sealed tenders must be lodged with the architect on or before January 7.

JANUARY 8.—**Teignmouth.**—GASHOLDER.—Teignmouth U.D.C. invite tenders for telescoping an 80-ft. gasholder. The drawings may be seen, and copies of the specification obtained, on application to Mr. J. Alex. Gray, Engineer and Manager, Gasworks, Teignmouth, to whom a payment of 1*l.* 1*s.* must be made. Sealed tenders, endorsed "Gasholder," and addressed to Mr. A. Percival Dell, Clerk to the Council, Town Hall, Teignmouth, to be delivered not later than 10 a.m. of January 8.

JANUARY 9.—**Southwark.**—STREET-WASHING MACHINES.—Southwark B.C. invite tenders for the construction of four street-washing machines. Plans and specifications may be seen, and all other particulars may be obtained, on application at the office of the Borough Engineer, Town Hall, Walworth-road, S.E., between the hours of 10 a.m. and 4 p.m. Sealed tenders, endorsed "Tender for Street-washing Machines," addressed to the Town Clerk, must be sent in not later than 4 o'clock on January 9.

JANUARY 10.—**Lincoln.**—ENGINE TURNTABLE.—The Great Central Railway Company invite tenders for the supply, delivery, and fixing of a 65-ft. engine turntable at Lincoln. Particulars can be obtained on application at the Engineer's Office, Marylebone Station, London. Sealed tenders, endorsed "Tender for Turntable at Lincoln," to be in the hands of Mr. O. S. Holt, Secretary, Marylebone Station, London, N.W., not later than 9 a.m. on January 10.

JANUARY 11.—**Londonderry.**—HEATING.—Londonderry Municipal Technical School Committee invite tenders, up till 3 p.m. on January 11, for heating and ventilating the school, according to plans, specification, and schedules prepared by Edward J. Toye, architect, 20, Great James-street, Londonderry. Copies of plans, etc., may be obtained from architect on a deposit of 2*l.* 2*s.* Tenders received by Mr. J. A. Williams, Secretary, Technical Instruction Committee, The Savings Bank, Londonderry.

JANUARY 12.—**London.**—VANS AND MACHINES.—Paddington Borough Council invite tenders for the supply of (*a*) four dust vans, (*b*) two slop vans, and (*c*) three sweeping machines. Printed forms of tender may be obtained upon application to Mr. E. B. B. Newton, Assoc.M.Inst.C.E., F.S.I., Borough Surveyor, Town Hall, Paddington, W. Tenders must be sent in for (*a*), (*b*), and (*c*) separately, sealed, in the envelopes supplied, and delivered not later than January 12.

JANUARY 12.—**Manchester.**—ENGINE.—Manchester Rivers Committee invite tenders for the supply and erection at the Withington Sewage Works, Chorlton-cum-Hardy, near Manchester, of one high-pressure vertical steam engine. Forms of tender may be obtained on application to the Secretary of the Rivers Department, Town Hall, Manchester. Tenders must be enclosed in the official envelope, which

must be returned without any distinguishing mark thereon. The last day for the receipt of tenders is January 12.

JANUARY 14.—**Bridgwater.**—WATER PIPES.—Bridgwater R.D.C. invite tenders for about 150 tons of cast-iron pipes, 3 in. and 2 in. in diameter, and other castings, to be made in accordance with the specification of their Engineer, Mr. W. A. Collins, Binford-place, Bridgwater. A copy of the specification may be obtained from Mr. T. M. Reed, Solicitor and Clerk to the Council, Bridgwater, on and after January 1, and on payment of 1*l.* 1s. Sealed tenders, endorsed "Tender for Cast-iron Pipes," are to be delivered, by post or otherwise, at the R.D.C. Office in Bridgwater, at or before noon of January 14.

JANUARY 29.—**Dublin.**—CRANES.—The Dublin Port and Docks Board invite tenders from crane makers for electric wharf cranes. The specification, together with a special form of tender, can be obtained at the office of the Engineer of the Board, Mr. John P. Griffith, M.Inst.C.E., East Wall, Dublin, on payment of 1*l.* Tenders, with contractors' supplemental specification and drawings, marked on the outside of the cover "Tender for Electric Wharf Cranes," must be delivered by post, sealed, prepaid, and addressed to the Secretary, Port and Docks Office, Westmoreland-street, Dublin, on or before January 29.

JANUARY 29.—**Dublin.**—PUMPING MACHINERY.—The Dublin Port and Docks Board invite tenders from centrifugal pump makers for electrical pumping machinery for their graving dock. The specification, together with a special form of tender, can be obtained at the office of the Engineer of the Board, Mr. John P. Griffith, M.Inst.C.E., East Wall, Dublin, on payment of 1*l.* Tenders, with contractors' supplemental specification and drawings, marked on the outside of the cover "Tender for Pumping Machinery," must be delivered by post, sealed, prepaid, and addressed to the Secretary, Port and Docks Office, Westmoreland-street, Dublin, on or before January 29.

JANUARY 30.—**Weaste, Salford.**—PUMPS.—Salford Corporation invite tenders for new sewage pumps to two large pumping engines at the Salford Sewage Works, Weaste. Drawings and specifications may be obtained from the Borough Engineer, Town Hall, Salford, on payment of 1*l.* Tenders, endorsed "Sewage Pumps," and addressed to the Chairman of the Rivers Committee, Town Hall, Salford, must be delivered at office of Mr. L. C. Evans, Town Clerk, Town Hall, Salford, not later than 12 noon on January 30.

FEBRUARY 13.—**Salford.**—ENGINES.—Salford Corporation invite tenders for air-compressing engines, etc., for 5 lb. per sq. in. through a line of 12-in. pipes. For particulars apply to the Borough Engineer, Town Hall, Salford. Tenders, endorsed "Air-compressing Engines," addressed to the Chairman of the River Committee, must be delivered at the Town Clerk's Office, Town Hall, Salford, not later than 12 noon on February 13.

FEBRUARY 16.—**Manchester.**—IRONWORK, BOILERS, ETC.—Manchester Corporation Waterworks Committee invite tenders for the supply of the undermentioned ironwork, boilers, engines, accumulators, etc., required in connexion with their new hydraulic pumping station, Water-street, Manchester:—Contract No. 3, tanks, girders, columns, coal chutes and measures, overhead runways, shafting, etc.; contract No. 4, boilers, superheaters, mechanical stokers, fuel economisers, etc.; contract No. 5, steam pumping engines, travelling crane, hydraulic motors, hydraulic engines, etc.; contract No. 6, air lift plant, consisting of vertical steam driven air compressor, air lift device, pipes, etc.; contract No. 7, hydraulic accumulators, hydraulic coal discharging apparatus, etc. Drawings, specifications, and forms of tender may be obtained upon application to the Secretary, Waterworks Offices, Town Hall, Manchester. A fee of 5*l.* 5s. will be charged for each specification. Further particulars may be obtained from the Engineer and Manager, Hydraulic Power Station, Whitworth-street West, Manchester. Sealed tenders, enclosed separately and endorsed "Hydraulic Power, Tender for ——, Contract No. ——," as the case may be, to be forwarded to the Chairman of the Waterworks Committee at the Town Hall, Manchester, not later than February 16.

MISCELLANEOUS.

DECEMBER 31.—**Blackpool.**—LITHOGRAPHING.—Blackpool Corporation invite tenders for lithographing 6,000 copies of a new picture-poster by Mr. John Hassall, R.I. The design for reproduction can be inspected at office of Mr. Charles Noden, Advertising Manager, Town Hall, Blackpool. The general conditions to be observed in the submission of tenders may be obtained on application, and tenders must be delivered, under seal, marked "Poster," not later than December 31.

JANUARY 2.—**Chepping Wycombe.**—TIP CART.—The Corporation invite tenders for a new tip cart, similar to No. 2, to be seen at the Corporation yard. Tenders, endorsed "Tip Cart," to be left at office of Mr. T. J. Rushbrooke, Borough Surveyor, 77, Easton-street, addressed to the Chairman of the Public Works Committee, by noon on January 2.

JANUARY 4.—**Brinsworth, Dinnington, Garforth.**—FURNISHING.—West Riding C.C. Education Department invite tenders for furniture required at Brinsworth new Provided School, Dinnington new Provided School, Garforth new Provided School. Full particulars may be obtained from the Education Department, Elementary Branch, County Hall, Wakefield. Tenders must reach the County Hall not later than 9 a.m., January 4.

* JANUARY 4.—**Islington.**—FITTINGS.—The Islington [illegible] are prepared to receive names of firms willing to tender for the supply of the library fittings for the Islington Central Library, Holloway-road, N. A limited number of names will be selected. Applications should contain particulars of similar works carried out (if any), to be endorsed "Library Fittings," and be delivered to the Clerk, Town Hall, Upper-street, N., not later than 4 p.m., January 4.

JANUARY 5.—**Manchester.**—TIMBER.—Manchester Education Committee invite tenders for the supply of timber (cut to certain sizes) for the handicraft centres. A specification of the timber required may be obtained at the offices in Deansgate, Manchester, on a deposit of 1*l.* 1s. Tenders, on the forms provided, addressed to the Chairman of the Elementary Education Sub-committee, must be delivered at the Deansgate offices of the Education Committee not later than January 5.

JANUARY 5.—**West Ham.**—REPAIR OF TOOLS.—West Ham Education Committee invite tenders from firms in the Borough of West Ham for the repair and grinding of tools used in the thirteen woodwork centres under their control for the period ending March 31, 1908. Full particulars and specifications can be obtained on application at the Education Offices, 95, The Grove, Stratford; and sealed tenders must be delivered at the Education Offices on or before January 5.

JANUARY 7.—**London.**—PADLOCKS AND KEYS.—The Commissioners of Customs invite tenders for the supply of padlocks and keys during the next three years. Full particulars may be obtained on application, by letter or personally, between 10 a.m. and 4 p.m., to the Office Surveyor, Custom House, Lower Thames-street, E.C., at whose office a specimen lock and key may be seen. Tenders, in sealed envelopes, marked "Tender for Padlocks," should be forwarded to the Secretary, H.M. Customs, Lower Thames-street, London, E.C., on or before January 7.

JANUARY 7.—**Pontypridd.**—WAGGONS.—Pontypridd U.D.C. invite tenders for the supply (complete) of four four-wheeled tip waggons, suitable for scavenging purposes. Specification can be seen on application at the office of the Engineer and Surveyor, Mr. P. R. A. Williughby, A.M.Inst.C.E. Tenderers must state the earliest date of delivery. Tenders, sealed, and endorsed "Tenders for Waggons," must be received by Mr. J. Colenso Jones, Clerk to the Council, Municipal Buildings, Pontypridd, not later than January 7.

* JANUARY 11.—**Aberystwyth.**—EQUIPMENT OF NEW DAVIES MEMORIAL CHEMICAL LABORATORIES AT ABERYSTWYTH.—Drawing seen, and specifications obtained, of Dr. Sudborough, University College, Aberystwyth, or the architect, Mr. A. W. Cross, 46, New Bond-street, London, W., after December 18. Tenders to be in by January 11.

JANUARY 15.—**Farnworth.**—RECREATION GROUND.—Farnworth U.D.C. invite tenders for materials and labour required in the construction of recreation ground and bowling green in Harroby-street and Mossfield-road, within their district. Drawings may be seen, and quantities obtained, at the offices of the surveyor, Mr. W. J. Lomax, A.M.Inst.C.E., 11, Fold-street, Bolton, on deposit of a cheque for 2*l.* Tenders, sealed, and endorsed "Recreation Ground," to be delivered to Mr. W. Tyldsley, Clerk, Council Offices, Farnworth, S.O., not later than January 15.

PAINTING, etc.

DECEMBER 31.—**Widnes.**—PAINTING, ETC.—Widnes Corporation invite tenders for the painting and cleaning of the interior of the fire-station and cottages, situate in Lacey-street. Specifications, etc., may be obtained upon application to Mr. J. S. Sinclair, A.M.Inst.C.E., Borough Surveyor, Widnes. Tenders, endorsed "Painting Fire-station and Cottages," must be delivered to Mr. H. S. Oppenheim, Town Clerk, Town Hall, Widnes, not later than noon on December 31.

JANUARY 2.—**Duffryn Mawr.**—PAINTING.—Llandaff and Dinas Powis R.D.C. invite tenders for repainting the iron bridge across the River Ely, near Duffryn Mawr, Pendoylan. Specification can be seen at the office of the surveyor, Mr. James Holden, A.M.Inst.C.E., 20, Park-place, Cardiff. Tenders to be sent to Mr. M. Warren, Clerk to the Council, Park House, Cardiff, not later than 12 o'clock noon on January 2.

ROADS, SANITARY, AND WATER WORKS.

DECEMBER 29.—**Lostock Hall.**—STREET WORKS.—Walton-le-Dale U.D.C. invite tenders for the sewering, forming, paving, and flagging of King-street and Queen-street, Lostock Hall. Plans and sections may be seen, and a copy of the specification and bill of quantities obtained, at the office of Mr. F. E. Dixon, C.E., 49, Lune-street, Preston, on payment of the sum of 1*l.* Tenders, endorsed "Private Street Works," to be delivered to Mr. W. S. Woodcock, Clerk of the Council, Council Offices, Bamber-bridge, not later than 12 o'clock noon on December 29.

JANUARY 1.—**Poole.**—STREET WORKS.—Poole Borough Council invite tenders for making up, under the Private Street Works Act, the following roads:—(1) Penn Hill-avenue; (2) St. Osmund's-road (middle section). Particulars may be obtained on application to the Borough Surveyor. Tenders to be delivered at the Borough Surveyor's office before 9.30 a.m. on January 1.

JANUARY 2.—**Chepping Wycombe.**—DRAIN.—The Corporation invite tenders for an extension of the surface-water drain in Amersham-hill. Quantities and forms of tender may be obtained, and specification and plan seen, at office of Mr. T. J. Rushbrooke, Borough Surveyor, 77, Easton-street. Tenders, endorsed "Amersham-hill S.W.D.," and addressed to the Chairman of the Public Works Committee, to be left at Borough Surveyor's Office by noon on January 2.

JANUARY 2.—**Chepping Wycombe.**—ROADWORKS.—The Corporation invite tenders for the making-up, kerbing, channelling, etc., of the private streets known as Roberts and Benjamin roads. Quantities and forms of tender may be obtained, and specifications and plans seen, at office of Surveyor. Tenders, endorsed "Benjamin and Robert's Roads," and addressed to the Chairman of the Public Works Committee, to be left at office of Mr. T. J. Rushbrooke, Borough Surveyor, 77, Easton-street, by noon on January 2.

JANUARY 3.—**Croydon.**—KERBING.—Croydon R.D.C. invite tenders for the supply and delivery of about 31,000 lin. ft. of 6-in. by 12-in. Norway granite kerb. Particulars as to delivery and form of tender may be obtained from Mr. J. S. Killick, the Council's Highway Surveyor, at his office, Town Hall, Croydon. Tenders to be delivered to Mr. E. J. Gowen, Clerk of the Council, Town Hall, Croydon, not later than 12 o'clock noon on January 3.

JANUARY 3.—**Huddersfield.**—DRAINING.—Huddersfield Corporation invite tenders for the works required to be done in the draining of Ivy-street, Crosland Moor. The successful tenderer will be required to execute a contract, the draft of which may be inspected at the Town Clerk's Office, Town Hall, between 10 and 4 o'clock. Plans, specifications, and general conditions may be seen, and bills of quantities and forms of tender obtained, on application at the offices of the Borough Engineer and Surveyor, 1, Peel-street. Sealed tenders, endorsed "Tender for Ivy-street Draining," addressed "Town Clerk, Town Hall, Huddersfield," must reach him not later than January 3.

JANUARY 3.—**Southend.**—ROAD WORKS.—Southend-on-Sea Corporation invite tenders for the making-up of the following streets:—Westborough-road (part of); Ilfracombe-avenue; Lovelace-gardens (east); York-road (east); Finchley-road (part of); Wenham-drive (part of); Cotswold-road (part of); Wallace-avenue; back passage, Seaforth-road. Plans, sections, and specifications may be seen, and bills of quantities and forms of tender obtained, on deposit of cheque for 1*l.* 1s. in respect of each street, upon application to Mr. E. J. Elford, M.I.M.E., Borough Surveyor. Sealed tenders, endorsed with the name of the street and marked "Tender for Private Street Works," to be delivered at office of Mr. William H. Snow, Town Clerk, Town Clerk's Office, Southend-on-Sea, before 12 noon on January 3.

JANUARY 4.—**Leeds.**—STREET WORKS.—Leeds Highways Committee invite tenders for the paving and flagging of the following streets:—Glensdale-terrace, Charlton-road, Sturdie-street, Sturdie-place, Arundel-place, Dorset-avenue, Dorset-street, Dorset-mount, and back Dorset-mount. Drawings may be seen at the City Engineer's Office, Municipal Buildings. Forms of tender and bills of quantities may be obtained, and copies of the documents forming the contract inspected, on application at the Highways Office, 155, Kirkstall-road. Sealed tenders, endorsed "Tender for Private Street Works," and addressed to the Highways Committee, must be delivered at the Town Clerk's Office, Town Hall, Leeds, not later than 10 a.m. on January 4.

JANUARY 5.—**Manchester.**—STREET WORKS.—Manchester Corporation (Withington Committee) invite tenders for the several works required in making-up Lloyd-street South, Withington, and Claremont-road, Withington. Plans, sections, and specifications of the work can be seen, and a form of tender, etc., obtained from the Surveyor to the Committee, Town Hall, West Didsbury. Tenders, to be endorsed "Tenders for Street Works," and to be returned, addressed to the Chairman of the Withington Committee, Town Hall, West Didsbury, not later than noon on January 5.

JANUARY 8.—**Crewe.**—ROAD WORKS.—The Crewe Town Council invite tenders for the making and sewering of Beech-grove, and for the making of Lunt-aveme, West-avenue, and passage on the east-south of West-avenue. Plans, etc., may be seen, and information obtained, upon application to Mr. G. Eaton-Shore, Borough Surveyor, Earle-street, Crewe. A deposit of 1*l.* will be required. Sealed tenders and schedule of prices, upon printed forms, to be obtained from the Borough Surveyor, must be delivered at office of Mr. Frederick Cooke, Town Clerk, Municipal Offices, Crewe, not later than 9 o'clock a.m. on January 8, endorsed "Tenders for Street-making."

JANUARY 8.—**Crook.**—SEWER.—The Crook Sewage Farm Joint Committee invite tenders for taking up, relaying, and diverting about 995 lineal yds. of 18-in. sanitary pipe sewer, from Beechburn Bridge to the sewage farm. Plans, etc., can be seen, and further information obtained, on application at the office of Mr. C. Johnston, C.E., Victoria-street-chambers, Bishop Auckland, between the hours of 10 a.m. and 4 p.m. Tenders (on forms to be obtained from the engineers) to be delivered to Mr. E. Milburn, Clerk to the Joint Committee, North View, Tow Law, properly endorsed, not later than January 8.

JANUARY 8.—**Dagenham.**—SEWER.—West Ham Borough Council invite tenders for the construction of a sewer, etc., at the small-pox hospital, Dagenham. Plans may be seen, and specification, etc., obtained, at the office of Mr. John G. Morley, Borough Engineer, Town Hall, West Ham, E., upon payment of 1*l.* Tenders, endorsed "Tender for Sewer, Dagenham," to be sent to office of Mr. Fred. E. Hilleary, Town Clerk, Town Hall, West Ham, E., not later than 4 o'clock on January 8.

JANUARY 8.—**Edmonton.**—GRANITE PITCHINGS.—The Edmonton U.D.C. invite tenders for dressing 1,200 yds. (more or less) of granite pitchings and laying same to proper levels in the Town Hall Yard, Lower Edmonton. Full particulars can be had on application to Mr. G. Eedes Eachus, Engineer to the Council, Town Hall, Edmonton. Sealed tenders, marked "Tender for Granite Pitchings," must be delivered at office of Mr. Wm. Francis Payne, Clerk of the Council, Town Hall, Edmonton, not later than 12 o'clock noon on January 8.

JANUARY 8.—**Ilford.**—STREET WORKS.—Ilford U.D.C. invite tenders for levelling, metalling, flagging, channelling, lighting, and making good Audley and Oakwood-gardens, in the U.D. of Ilford, Essex. Plans and specifications may be seen, and forms of tender and bills of quantities obtained, on payment of a deposit of 2*l.* 2s., on application to Mr. Herbert Shaw, M.Inst.C.E., Surveyor to the Council, at the Town Hall, Ilford, Essex. Sealed tenders, endorsed "Tender for Private Street Works," must be sent to Mr. John W. Benton, Clerk, Town Hall, Ilford, Essex, on or before noon on January 8.

JANUARY 8.—**Lewisham.**—ROAD WORKS.—Lewisham B.C. invite tenders for kerbing, channelling, and metalling the roadway and paving the footpaths with artificial stone (in separate contracts) of Canonbie-road, and part of Sunderland-road, Forest Hill, and York stone paving on edge in the case of part of Canonbie-road. Also for supplying and laying artificial stone in High-road, Lee. The plans, etc., may be seen, and forms of tender obtained, at the Town Hall, Catford (Surveyor Department). Copies of the specification may be had on payment of the sum of 5s. in each case, which will not be returned. The tenders must be on forms issued by the Council, enclosed in an envelope, sealed and endorsed "Tender for ——," and must be delivered by 4 o'clock on January 8, at the Town Hall, and placed in the box there provided for the purpose.

JANUARY 8.—**Seghill.**—SEWERS.—Seghill U.D.C. invite tenders for the laying of about 1,000 yds. of

pipe sewers with manholes, lampholes, and flushes complete, together with the construction of tanks, bacteria beds, and other works for sewage disposal purposes at Seghill. Plans and specifications may be seen, and quantities and other particulars obtained, on application to the engineer, Mr. J. E. Parker, civil engineer, Post Office-chambers, Newcastle-on-Tyne, on depositing 1*l.* 1s. Sealed tenders, endorsed "Seghill Sewage," to be delivered at office of Mr. T. Spencer, Clerk, Seghill, Northumberland, not later than noon, January 8.

JANUARY 8.—**Yeovil.**—ROAD WORKS.—Yeovil Corporation invite tenders for the supply, delivery, and laying of Keinton or other stone paving, kerbing, water-table, and block pitching at Yeovil. Also for the supply of flints (hand-picked and quarried), broken stone, gravel, and asphalt during the three years ending March 31, 1910. Copies of specifications and forms of tender may be obtained at the office of Mr. A. Oddy, Borough Surveyor, Municipal Offices, Yeovil, to whom sealed and endorsed tenders, with samples, must be delivered not later than noon on January 8, addressed to the Chairman of the Stores Committee.

* JANUARY 9.—**Hammersmith.**—PAVING WORKS.—The Hammersmith Borough Council invite tenders for making up and paving Eynham-road (section 1). Plans and specifications may be seen, and forms of tender obtained, on application to Mr. H. Muir, Borough Surveyor. Sealed tenders, endorsed "Tender for Paving Works," to be delivered to Mr. H. Thompson, Town Clerk, Town Hall, Hammersmith, by 6 p.m., January 9.

JANUARY 14.—**Bridgwater.**—WATER SUPPLY.—Bridgwater R.D.C. invite tenders for the laying of 8,556 yds. or thereabouts of cast-iron pipes, 2 and 3 in. in diameter, and other works appertaining thereto, including the construction of two concrete piers on the banks of the River Parrett, in accordance with the drawings, specifications, and instructions of their Engineer, Mr. W. A. Collins, Binford-place, Bridgwater. Drawings may be seen, and copies of the specification and bill of quantities obtained, at the R.D.C. Offices in Bridgwater on and after January 1 next on payment of 1*l.* 1s. Sealed tenders, addressed to Mr. T. M. Reed, Solicitor and Clerk to the above Council, Bridgwater, and endorsed "Tender for Pipe-laying," are to be delivered by post or otherwise at the R.D.C. Offices in Bridgwater at or before noon of January 14.

JANUARY 17.—**Burnley.**—ROAD WORKS.—For kerbing, flagging, paving, and making-up of a number of streets in the village of Hapton, for the Burnley R.D.C. Drawings and specifications may be seen, and form of tender, etc., obtained, from Mr. S. Edmondson, surveyor, 18, Nicholas-street, Burnley. Sealed tenders, endorsed "Private Street Works, Hapton," to be delivered at the office of Mr. J. S. Horn, Clerk, 18, Nicholas-street, Burnley, by January 17.

* JANUARY 18.—**Hither Green.**—CONVENIENCES.—The London C.C. invite tenders for the erection of conveniences at Mountsfield Park, Hither Green, S.E. Full particulars may be seen in the *London County Council Gazette* of December 31, to be obtained from Messrs. P. S. King & Son, 2, Great Smith-street, S.W. Tenders to be delivered not later than 10 a.m., January 18.

JANUARY 22.—**Bampton.**—DRAINAGE.—Bampton U.D.C. (North Devon) invite tenders for the construction of main drainage works. The plans, etc., can be seen upon application at the offices of Mr. Nicholson Lailey, M.Inst.C.E., F.G.S., 53, Victoria-street, Westminster, S.W., on and after January 7 until January 18. Sealed tenders, endorsed "Bampton Main Drainage," are to be sent to Mr. E. P. Row, Clerk, U.D.C. Offices, Bampton, N. Devon, on January 22, by 12 o'clock.

JANUARY 22.—**Bath.**—WATERWORKS.—Bath Corporation Waterworks Committee invite tenders for repairing and lining their two reservoirs at Batheaston, and for constructing a new straining well and other works. Plans, etc., may be seen at the Engineer's Office, and specification, schedule of quantities, and form of tender may be obtained, on payment of 2*l.* 2s., on and after January 8. Tenders, addressed to the Chairman of the Waterworks Committee, and endorsed "Tenders for Work at Batheaston Reservoirs," must be sent in before 10 a.m. on January 22. The Engineer will meet intending contractors on January 11, at the Guildhall, at 10 a.m., and will accompany them to the site of the works.

JANUARY 28.—**Gobowen and Whittington.**—WATER SUPPLY.—Oswestry R.D.C. invite tenders for the providing and laying of about 8,500 yds. of water mains in connexion with wafer supply for the district of Gobowen and Whittington. The drawings may be seen, and copies of the specification, bill of quantities, and form of tender, may be obtained at the offices of the engineers, Messrs. Berrington, Son, & Martin, civil engineers, Wolverhampton; and 28, Victoria-street, Westminster, S.W., upon payment of a deposit of 5*l.* 5s. Sealed tenders, addressed to Mr. Charles H. Bull, Clerk to the Council, Oswestry, and endorsed "Tender for Water Works," must be delivered at office of Clerk before noon on January 28.

STONE, MATERIALS, AND STORES.

JANUARY 1.—**Horsham.**—ROAD MATERIALS.—Horsham U.D.C. invite tenders for the supply of the following road materials:—450 tons of good hard stone, broken to 1½-in. gauge; 350 yds. of broken pit flints, 1½-in. gauge; to be delivered free at Horsham Railway Station not later than March 30, in such quantities and at such times as shall be directed in writing by the Council's Surveyor. Sealed tenders, endorsed "Tender for Road Materials," quoting a price per ton or yard, and accompanied by a small sample of the material quoted for, to be delivered to Mr. S. Mitchell, Clerk, Council Offices, Horsham, not later than January 1.

JANUARY 1.—**London.**—STORES.—Bombay, Baroda, and Central India Railway Directors invite, up to noon on January 1, tenders for the supply of the following stores, viz.:—(1) Accumulator cells, etc.; (2) bunting, canvas, etc.; (3) eye bolts and strand wire, for fencing. Tenders must be made on forms, copies of which, with specifications, can be obtained at offices of Mr. W. V. Constable, Secretary, Gloucester House, 2, 3, and 4, Bishopsgate-street Without, London, E.C., on payment of 21s. each (which will not be returned).

JANUARY 9.—**Durban, Natal.**—STONEWARE PIPES.—The Corporation of Durban, Natal, invite (from manufacturers only) tenders for the supply and delivery, "free on board," of two miles each of 6-in., 7-in., and 8-in. diameter stoneware sewerage pipes. Specifications can be obtained from Mr. W. H. Radford, C.E., Albion-chambers, Nottingham, Consulting and Representative Engineer to the Corporation, on deposit of 1*l.* 1s. Sealed and endorsed tenders must be delivered to Messrs. Webster, Steel, & Co., agents to the Durban Corporation, 5, East India-avenue, Leadenhall-street, London, E.C., agents to the Durban Corporation, on or before January 9.

JANUARY 9.—**London.**—GRANITE SPALLS.—The Guardians of the Poor of the Parish of St. Giles, Camberwell, invite tenders for the supply of granite spalls, to be delivered at their Workhouse, Gordon-road, Peckham. Forms of tender, with further particulars, may be obtained upon application to Mr. Charles S. Stevens, Clerk to the Guardians, Guardians' Offices, 29, Peckham-road, S.E., and must be returned to the Board of Guardians, duly completed and marked "Tender for Granite," before 12 o'clock noon on January 9.

* JANUARY 21.—**Camberwell.**—STORES, ETC.—The Camberwell B.C. invite tenders for the supply of stores, materials, etc. (for particulars see advertisement), to commence April 1, 1907, and terminate March 31, 1908. Forms of tender obtainable from Mr. William Oxtoby, Borough Engineer, Town Hall, Camberwell, S.E., specifying section desired. Samples can be inspected at Grove Vale Depôt, opposite East Dulwich Station, between 10 a.m. and 12 noon and 1 p.m. to 4 p.m. Monday to Friday (Saturday to 1 p.m.). Tenders must be delivered at the Town Hall not later than 5·30 p.m., January 21.

NO DATE.—**Eastry.**—FLINTS.—Eastry R.D.C. invite tenders for the supply of picked flints, to be delivered into the depôts of the Council at any time prior to March 31, and to be paid for by the Council on or before June 1. Mr. Fred S. Cloke, Clerk to the Council, Sandwich.

Public Appointment.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in
*SURVEYOR AND INSPECTOR OF NUISANCES	Wrotham U.D.C.	100*l.* per annum, etc.	Jan. 5

Auction Sales.

Nature and Place of Sale.	By whom Offered.	Date of Sale.
*TIMBER MERCHANT'S STOCK—At site adjoining 126, Norwood-road, S.E.	Veryard & Yates	Jan. 3
*TIMBER, 103, LAVENDER-HILL, BATTERSEA—On the Premises	Joseph Hibbard & Sons	Jan. 7, 8, & 9

PATENTS.—*Continued from page 758.*

lock casing, that are actuated from the bolt of the lock.

14,497 of 1906.—T. J. MCCARTHY: *Revolving Portable Platform Elevators or lifts.*

This relates to a revolving portable elevator, and consists in the combination with a truck, of a frame comprising columns rigidly united at the top, and provided at the bottom with a laterally projected base revoluble upon the truck bed, a platform with guides connecting it with the frame, a sheave having a suitable connexion with the top of the columns, a winding drum, and in mounting therewith revoluble with the frame and base, gears and shafting to control the movements of the winding drum, a hoisting cable connecting with the winding drum, thence passing over the sheave and down to a connexion with the platform guides, and means for turning the drum and winding the cable thereon.

15,607 of 1906.—OTIS ELEVATOR CO., LTD. (OTIS ELEVATOR COMPANY): *Elevators or Lifts.*

This relates to an elevator or lift, and consists in the combination with a lower carrier or cage, flexible hoisting and suspending means therefor, and a friction-driving device, of means having a give-and-take action, and interposed between the lower carrier and the opposite leaves, or all the leaves of the flexible means winding respectively on and off the driving device, whereby tension on the leaves changes in predetermined ratio to the weight of the load.

16,550 of 1906.—G. R. FEATHER: *Screw-down Valves.*

This relates to a valve formed to receive a washer on one side, and the enlarged end of the operating screw on the other side of it, together with nuts for securing said washer and screw in position while the operating spindle is actuated by gearing wheels shaped so that they will carry the operating shaft and hand-wheel throughout its longitudinal movements.

20,020 of 1906.—F. MITCHELL and F. GUNN: *Clasps for Securing Planks of Scaffolding together, applicable also for use in connexion with Planks for other Purposes.*

This relates to a clamp for securing the planks of scaffolding, or the like, together, consisting of a rectangular brace formed with a hole through it, and having its top member slightly inclined, or formed with a sharp edge or one or more sharp points and a loop or solid plate secured to the lower end side of said brace or formed in one therewith, having its upper surface inclined and provided with a number of serrated teeth or a suitably roughened surface or sharp edge or parts.

24,224 of 1906.—A. KLINGE and C. SCHOURUP: *Manufacture of Artificial Stones and Similar Building Materials.*

This relates to a method of producing building stones and similar building materials according to which clay is mixed with water, allowed to settle and thoroughly kneaded, and then kneaded again with a dry mixture of cement and sand, and a suitable addition of water, for the purpose of forming stones therewith, which are dried in the air.

504 of 1906.—E. HUGHES: *Reinforced Concrete or like Piles, Pillars, and Columns.*

This relates to reinforced concrete or like piles and the like, comprising a solid or hollow metal column having a number of projecting flanged ribs or rings forming grooves for boring the said internal column, and the concrete or the like forming the mass of the pile.

24,219 of 1906.—A. GARDEUR: *Process for the Manufacture of Artificial Sandstone.*

This relates to a process for the manufacture of artificial stone by means of sand and lime to which slag, cement, or finely pulverised metallic scoria are added, this process consisting in subjecting the agglomerates obtained by the usual methods, after they have set cold, to the action of water at a high temperature under pressure in a digester apparatus, and then, after discharging the water, drying the products by steam and cooling them, for the purpose of transforming the chemical combinations formed during the cold setting of the cement into combinations of complex basic silicates different as regards molecular grouping, and accordingly imparting to the agglomerate a greater resistance to crushing,

and at the same time the structure, physical appearance, and, generally speaking, all the properties of natural sandstone.

14,233 of 1906.—R. LIEBOLD, F. E. WITTIG, and C. GRIMM: *Manufacture of Cement.*

This relates to a process for the manufacture of cement which, after it has set, is waterproof and free from efflorescence, and is characterised in that the cement clinkers are impregnated in a warm condition with soap mixture of a suitable kind for the purpose of evaporating in a very short time, the water which serves for the solution of the impregnating agent by the action of the heat remaining in the cement clinkers, and by this means avoiding premature setting of the cement.

14,509 of 1906.—F. SHUMAN: *Piles and Process for Constructing the same.*

This consists in constructing piles by forming an opening in the ground by means of a hollow preparatory pile, filling the base of the said opening with grouting, mounting on this base a moulded concrete or reinforced concrete pile section prior to the withdrawal of the hollow preparatory pile, and gradually withdrawing the shell or body part of the said hollow preparatory pile and filling the space left by the shell above the base section with grouting so as to surround the moulded pile section.

15,553 of 1906.—S. SCHOUGAARD: *Manufacture of Artificial Marble.*

This relates to the manufacture of artificial marble, and consists in the employment of a small quantity of dextrine which is stirred out in equal parts of boiled milk and water, and to which alum, gypsum, or Keen's cement and flour of Carrara marble are added in the proportions of 3 to 1. The mass is stirred until a homogeneous compound is obtained, a pigment or other colouring matter being added according to the sort of marble it is desired to imitate, the mass being then formed on a plate of glass or the like.

13,320 of 1906.—L. EMONTS: *Burr-cutting Device for Ground Tile Presses.*

This relates to a tile press for ground tiles, and consists of a burr-cutting device pivoted in the frame of the press above the rotatable mould drum, and adapted to oscillate in a vertical plane towards and from the said mould drum in order to have the burr of a pressed tile cut off by the burr cutter, while at the same time another tile is pressed on the mould drum.

13,723 of 1906.—O. JAGGER: *Machines for Planing and Pressing Stone, Marble, Granite, and the like.*

This relates to a machine for planing and pressing stone, marble, granite, and the like, and consists in mounting the dogs or "kickers" upon a shaft carried from the table and capable of having a rotating movement imparted thereto whereby said dogs or "kickers" can readily be moved from and reinstated into their working positions, means being provided whereby the dogs or "kickers" can be retained in a operative or inoperative position.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

December 8.—By FRANKLIN & GALE (at Oxford).

Great Milton, Oxon.—"The Priory" and 6 acres, f. £3,150

December 14.—By BRODIE, TIMBS, & Co. (at High Wycombe).

Bledlow Ridge, Bucks.—Three freehold cottages and 6 acres, y.r. 28*l.* 10*s.* 515

December 17.—By HARRODS'.

Twickenham.—24, Queen's-rd., u.t. 62½ yrs., g.r. 6*l.* 10*s.*, y.r. 34*l.* 305

East Ham.—4, Oakfield-rd., f., w.r. 28*l.* 12*s.* .. 180

By NICHOLAS, DENYER, & Co.

Dulwich.—Alleyn-rd., l.g. rents 23*l.* 10*s.*, u.t. 65½ yrs., g.r. 2*l.* 395

DREWEATT & WATSON (at Newbury).

Newbury, Berks.—18, Oxford-st. (s.), f., y.r. 20*l.* 16*s.* 230

Pembroke-rd., two freehold cottages, w.r. 15*l.* 12*s.* 165

Grafton-pl., five freehold cottages and workshop, w.r. 63*l.* 14*s.* 530

December 19.—By A. PERCY OSBORNE.

Victoria Park.—121, Cadogan-ter., f., y.r. 28*l.* 320

Holloway.—69, Hornsey-rd. (s.), u.t. 39½ yrs., g.r. 6*l.* 6*s.*, y.r. 40*l.* 295

Gray's Inn-road.—12, Wells-st., u.t. 35½ yrs., g.r. 5*l.*, y.r. 46*l.* 400

Clerkenwell.—34 and 36, Great Percy-st., u.t. 10½ yrs., g.r. 12*l.*, y.r. 105*l.* 280

By NOYS & HOWES (at Woolwich).

Plumstead, Kent.—103, Plumstead-rd., u.t. 9 yrs., g.r. 3*l.*, w.r. 31*l.* 4*s.* 125

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold, p. for possession; e.r. for estimated rental; w.r. for weekly rental; q.r. for quarterly rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; la. for lane; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gdns. for gardens; yd. for yard; gr. for grove; b.h. beerhouse; p.h. for public-house; o. for office; s. for shop; ct. for court.

MEETINGS.

SATURDAY, DECEMBER 29.

Royal Institution (Christmas Lectures).—Mr. W. Duddell on "Signalling to a Distance, from Primitive Man to Radiotelegraphy," II. 3 p.m.

TUESDAY, JANUARY 1.

Royal Institution.—Mr. W. Duddell, M.I.E.E., on "Signalling to a Distance, from Primitive Man to Radiotelegraphy," IV. 3 p.m.

WEDNESDAY, JANUARY 2.

Builders' Foremen and Clerks of Works' Institution.—Ordinary meeting of the members. 8 p.m.

THURSDAY, JANUARY 3.

Royal Institution.—Mr. W. Duddell on "Signalling to a Distance, from Primitive Man to Radiotelegraphy," V. 3 p.m.

SATURDAY, JANUARY 5.

Royal Institution.—Mr. W. Duddell on "Signalling to a Distance, from Primitive Man to Radiotelegraphy," VI. 3 p.m.

TO CORRESPONDENTS.

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

We cannot undertake to return rejected communications; and the Editor cannot be responsible for drawings, photographs, manuscripts, or other documents, or for models or samples, sent to or left at this office, unless he has specially asked for them.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

All communications must be authenticated by the name and address of the sender whether for publication or not. No notice can be taken of anonymous communications.

We are compelled to decline pointing out books and giving addresses.

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All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER and *not* to the Editor.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£ s. d.	
Hard Stocks	1 10 0	per 1000 alongside, in river.
Rough Stocks and Grizzles	1 7 0	" " "
Picked Stocks for Facings	2 17 6	" delivered.
Flettons	1 8 0	" at railway depôt.
Red Wire Cuts	1 14 0	" " "
Best Fareham Red	3 12 0	" " "
Best Red Pressed Buabon Facing	5 0 0	" " "
Best Blue Pressed Staffordshire	3 15 0	" " "
Do. Bullnose	4 0 0	" " "
Best Stourbridge Fire Bricks	3 14 0	" " "
GLAZED BRICKS.		
Best White and Ivory Glazed Stretchers	12 0 0	" " "
Headers	11 0 0	" " "
Quoins, Bullnose, and Flats	16 0 0	" " "
Double Stretchers	19 0 0	" "
Double Headers	16 0 0	" " "
One Side and two Ends	19 0 0	" " "
Two Sides and one End	20 0 0	" " "
Splays, Chamferred, Squints	20 0 0	" " "
Best Dipped Salt Glazed Stretchers, and Header	12 0 0	" " "
Quoins, Bullnose, and Flats	14 0 0	" " "
Double Stretchers	15 0 0	" " "
Double Headers	14 0 0	" " "
One Side and two Ends	15 0 0	" " "
Two Sides and one End	15 0 0	" " "
Splays, Chamferred, Squints	14 0 0	" " "
Second Quality White and Dipped Salt Glazed	2 0	" less than best.

	s. d.	
Thames and Pit Sand	7 0	per yard, delivered.
Thames Ballast	5 6	" "
Best Portland Cement	27 0	per ton, "
Best Ground Blue Lias Lime	19 0	" "

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime ..... 11s. 6d. per yard, delivered.
Stourbridge Fireclay in sacks 27s. 0d. per ton at rly. dpt.

STONE.

	s. d.	
BATH STONE—delivered on road waggons, Paddington Depôt	1 6½	per ft. cube.
Do. do. delivered on road waggons, Nine Elms Depôt	1 8½	" "
PORTLAND STONE (20 ft. average)—		
Brown Whitbed, delivered on road waggons, Paddington Depôt, Nine Elms Depôt, or Pimlico Wharf	2 1	" "
White Basebed, delivered on road waggons, Paddington Depôt, Nine Elms Depôt, or Pimlico Wharf	2 2½	" "

	s. d.	
Ancaster in blocks	1 10	per ft. cube, dald. rly. depôt.
Bear "	1 6	" "
Greenshill "	1 10	" "
Darley Dale in blocks	2 4	" "
Red Corsehill "	2 2	" "
Closeburn Red Freestone	2 0	" "
Red Mansfield "	2 4	" "
YORK STONE—Robin Hood Quality.		
Scappled random blocks	2 10	" "
6 in. sawn two sides landings to sizes (under 40 ft. super.)	2 3	per ft. super., "
6 in. rubbed two sides ditto, ditto	2 6	" "
3 in. sawn two sides slabs (random sizes)	0 11½	" "
2 in. to 2½ in. sawn one side slabs (random sizes)	0 7½	" "
1½ in. to 2 in. ditto, ditto	0 6	" "
HARD YORK—		
Scappled random blocks	3 0	per ft. cube, "
6 in. sawn two sides landings to sizes (under 40 ft. super.)	2 8	per ft. super., "
6 in. rubbed two sides ditto	3 0	" "
3 in. sawn two sides slabs (random sizes)	1 2	" "
2 in. self-faced random flags	0 5	" "

	s. d.	
Hopton Wood (Hard Bed) in blocks	2 0	per ft. cube, dald. rly. depôt.
" " " 6 in. sawn both sides landings	2 7	per ft. super. dald. rly. depôt.
" " " 3 in. sawn both sides random slabs	1 0	" "
" " " 2 in. do.	0 8½	" "

SLATES.

In. In.	£ s. d.	
20×10 best blue Bangor	13 2 6	per 1000 of 1200 at r. d.
20×12 " "	13 17 6	" "
20×10 first quality "	13 0 0	" "
20×12 " "	13 15 0	" "
16×8 " "	7 5 0	" "
20×10 best blue Portmadoc	12 12 6	" "
16×8 " "	6 12 6	" "
20×10 best Eureka unfading green	15 17 6	" "
20×12 " "	18 7 6	" "
18×10 " "	13 5 0	" "
16×8 " "	10 5 0	" "
20×10 permanent green	11 12 6	" "
18×10 " "	9 12 6	" "
16×8 " "	6 12 6	" "

TILES.

	s. d.	
Best plain red roofing tiles	42 0	per 1000 at rly. depôt.
Hip and Valley tiles	3 7	per doz. "
Best Broseley tiles	50 0	per 1000 "
Do. Ornamental tiles	52 6	" "
Hip and Valley tiles	4 0	per doz. "
Best Buabon red, brown, or brindled do. (Edwards)	57 6	" "
Do. Ornamental do.	60 0	" "
Hip tiles	4 0	per doz. "
Valley tiles	3 0	" "
Best Red or Mottled Staffordshire do. (Peakes)	51 9	per 1000 "
Do. Ornamental do.	54 6	" "
Hip tiles	4 1	per doz. "
Valley tiles	3 8	" "
Best "Rosemary" brand plain tiles	48 0	per 1000 "
Best Ornamental tiles	50 0	" "
Hip tiles	4 0	per doz. "
Valley tiles	3 8	" "
Best "Hartshill" brand plain tiles, sand-faced	50 0	per 1000 "
Do. pressed	47 6	" "
Do. Ornamental do.	50 0	" "
Hip tiles	4 0	per doz. "
Valley tiles	3 6	" "

WOOD.

BUILDING WOOD.	At per standard. £ s. d.	£ s. d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.	13 10 0	... 15 0 0
Deals: best 3 by 9	13 0 0	... 14 0 0
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.	11 0 0	... 12 0 0
Battens: best 2½ by 6 and 3 by 6	0 10 0	less than 7 in. and 8 in.
Deals: seconds	1 0 0	less than best.
Battens: seconds	0 10 0	" "
2 in. by 4 in. and 2 in. by 6 in.	9 0 0	... 10 0 0
2 in. by 4½ in. and 2 in. by 5 in.	8 10 0	... 9 10 0
Foreign Sawn Boards— 1 in. and 1½ in. by 7 in.	0 10 0	more than battens.
¾ in.	1 0 0	"

	At per load of 50 ft.	
Fir timber: best middling Danzig or Memel (average specification)	4 10 0	... 5 0 0
Seconds	4 0 0	... 4 10 0
Small timber (8 in. to 10 in.)	3 12 6	... 3 15 0
Small timber (6 in. to 8 in.)	3 0 0	... 3 10 0
Swedish balks	2 10 0	... 3 0 0
Pitch-pine timber (30 ft. average)	4 0 0	... 4 15 0

WOOD (*continued*).

JOINERS' WOOD.	At per standard. £ s. d.	£ s. d.
White Sea: first yellow deals, 3 in. by 11 in.	24 0 0	25 0 0
3 in. by 9 in.	22 0 0	23 0 0
Battens, 2½ in. and 3 in. by 7 in.	16 10 0	18 0 0
Second yellow deals, 3 in. by 1 in.	18 10 0	20 0 0
" " 3 in. by 9 in.	17 10 0	19 0 0
Battens, 2½ in. and 3 in. by 7 in.	13 10 0	14 10 0
Third yellow deals, 3 in. by 11 in. and 9 in.	13 10 0	15 0 0
Battens, 2½ in. and 3 in. by 7 in.	11 0 0	12 0 0
Petersburg first yellow deals, 3 in. by 11 in.	21 0 0	22 10 0
Do. 3 in. by 9 in.	18 0 0	19 10 0
Battens	13 10 0	15 0 0
Second yellow deals, 3in. by 11in.	16 0 0	17 0 0
Do. 3 in. by 9 in.	14 10 0	16 0 0
Battens	11 0 0	12 10 0
Third yellow deals, 3 in. by 11 in.	13 0 0	14 0 0
Do. 3 in. by 9 in.	12 10 0	14 0 0
Battens	10 0 0	11 0 0
White Sea and Petersburg—		
First white deals, 3 in. by 11 in.	14 10 0	15 10 0
" " 3 in. by 9 in.	13 10 0	14 10 0
Battens	11 0 0	12 0 0
Second white deals, 3 in. by 11 in.	13 10 0	14 10 0
" " 3 in. by 9 in.	12 10 0	13 10 0
" " battens	10 0 0	11 0 0
Pitch-pine: deals	18 0 0	21 0 0
Under 2 in. thick extra	0 10 0	1 0 0
Yellow Pine—First, regular sizes	44 0 0	upwards.
Oddments	32 0 0	"
Seconds, regular sizes	33 0 0	"
Yellow Pine oddments	28 0 0	"
Kauri Pine—Planks, per ft. cube	0 3 6	0 5 0
Danzig and Stettin Oak Logs—		
Large, per ft. cube	0 3 0	0 3 6
Small " "	0 2 6	0 2 9
Wainscot Oak Logs, per ft. cube	0 5 6	0 6 0
Dry Wainscot Oak, per ft. sup. as inch	0 0 8½	0 0 9½
⅞ in. do. do	0 0 7	—
Dry Mahogany—Honduras, Tabasco, per ft. super. as inch	0 0 9	0 1 0
Selected, Figury, per ft. super. as inch	0 1 6	0 2 6
Dry Walnut, American, per ft. super. as inch	0 0 10	0 1 0
Teak, per load	17 0 0	22 0 0
American Whitewood Planks, per ft. cube	0 4 0	0 5 0

Prepared Flooring, etc.—	Per square.	
1 in. by 7 in. yellow, planed and shot	0 13 6	0 17 6
1 in. by 7 in. yellow, planed and matched	0 14 0	0 18 0
1¼ in. by 7 in. yellow, planed and matched	0 16 0	1 0 0
1 in. by 7 in. white, planed and shot	0 12 0	0 14 6
1 in. by 7 in. white, planed and matched	0 12 6	0 15 0
1¼ in. by 7 in. white, planed and matched	0 15 0	0 16 6
⅞ in. by 7 in. yellow, matched and beaded or V-jointed brds.	0 11 0	0 13 6
1 in. by 7 in. " "	0 14 0	0 18 0
⅞ in. by 7 in. white " "	0 10 0	0 11 6
1 in. by 7 in. " "	0 12 9	0 15 0

6 in. at 6d. to 9d. per square less than 7 in.

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton. £ s. d.	£ s. d.
Rolled Steel Joists, ordinary sections	7 5 0	7 15 0
Compound Girders, ordinary sections	9 10 0	10 10 0
Steel Compound Stanchions	12 5 0	13 5 0
Angles, Tees, and Channels, ordinary sections	9 5 0	10 5 0
Flitch Plates	9 5 0	10 5 0
Cast Iron Columns and Stanchions including ordinary patterns	8 0 0	9 0 0

METALS.

	Per ton, in London. £ s. d.	£ s. d.
IRON—		
Common Bars	8 10 0	9 0 0
Staffordshire Crown Bars, good merchant quality	9 0 0	9 10 0
Staffordshire "Marked Bars"	11 0 0	—
Mild Steel Bars	9 5 0	9 10 0
Hoop Iron, basis price	9 10 0	9 15 0
" Galvanised	17 10 0	—

(*And upwards, according to size and gauge.)

Sheet Iron Black—		
Ordinary sizes to 20 g.	10 0 0	—
" " 24 g.	11 0 0	—
" " 26 g.	12 10 0	—
Sheet Iron, Galvanised, flat, ordinary quality—		
Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.	14 10 0	—
Ordinary sizes to 22 g. and 24 g.	15 0 0	—
" " 26 g.	15 10 0	—
Sheet Iron, Galvanised, flat, best quality—		
Ordinary sizes to 20 g.	17 10 0	—
" " 22 g. and 24 g.	18 0 0	—
" " 26 g.	19 10 0	—
Galvanised Corrugated Sheets—		
Ordinary sizes 6 ft. to 8 ft. 20 g.	14 10 0	—
" " 22 g. and 24 g.	14 15 0	—
" " 26 g.	16 0 0	—
Best Soft Steel Sheets, 6 ft. by 2 ft. to 8 ft. by 20 g. and thicker	12 0 0	—
Best Soft Steel Sheets, 22 g. & 24 g.	13 0 0	—
" " 26 g.	15 0 0	—
Cut Nails, 3 in. to 6 in.	10 0 0	10 10 0

(Under 3 in., usual trade extras.)

LEAD, &c.

	Per ton, in London. £ s. d.	£ s. d.
LEAD—Sheet, English, 3lb. and up	22 0 0	—
Pipe in coils	22 10 0	—
Soil pipe	25 0 0	—
Compo pipe	25 0 0	—

LEAD, &c. (*continued*).

	Per ton, in London. £ s. d.	£ s. d.
ZINC—Sheet—		
Vieille Montagne ton	34 0 0	—
Silesian	33 15 0	—
COPPER—		
Strong Sheet per lb.	0 1 4	—
Thin " "	0 1 5	—
Copper nails "	0 1 3	—
BRASS—		
Strong Sheet "	0 1 2	—
Thin " "	0 1 3	—
TIN—English Ingots "	0 1 11½	—
SOLDER—Plumbers' "	0 0 9	—
Tinmen's "	0 0 11½	—
Blowpipe "	0 1 1	—

ENGLISH SHEET GLASS IN CRATES OF STOCK SIZES.

15 oz. thirds	2½d. per ft. delivered.
" fourths	1½d. " "
21 oz. thirds	3½d. " "
" fourths	2½d. " "
26 oz. thirds	4½d. " "
" fourths	3½d. " "
32 oz. thirds	5d. " "
" fourths	4½d. " "
Fluted Sheet, 15 oz.	3½d. " "
" 21 oz.	4½d. " "

ENGLISH ROLLED PLATE IN CRATES OF STOCK SIZES.

⅛ Hartley's	2½d. per ft. delivered.
¼ "	2½d. " "
⅜ "	3d. " "
Figured and Oxford Rolled "Oceanic" Glass, white	4d. " "
Do. " tinted	5½d. " "

OILS, &c.

	£ s. d.
Raw Linseed Oil in pipes per gallon	0 1 10
" " " in barrels "	0 1 11
" " " in drums "	0 2 1
Boiled " " " in pipes "	0 2 0
" " " in barrels "	0 2 1
" " " in drums "	0 2 3
Turpentine in barrels "	0 4 0
" in drums "	0 4 2
Genuine Ground English White Lead per ton	25 0 0
Red Lead, Dry "	24 0 0
Best Linseed Oil Putty per cwt.	0 7 0
Stockholm Tar per barrel	1 12 0

VARNISHES, &c. Per gallon.

	£ s. d.
Fine Pale Oak Varnish	0 8 0
Pale Copal Oak	0 10 6
Superfine Pale Elastic Oak	0 12 6
Fine Extra Hard Church Oak	0 10 0
Superfine Hard-drying Oak, for seats of Churches	0 14 0
Fine Elastic Carriage	0 12 6
Superfine Pale Elastic Carriage	0 16 0
Fine Pale Maple	0 16 0
Finest Pale Durable Copal	0 18 0
Extra Pale French Oil	1 1 0
Eggshell Flatting Varnish	0 18 0
White Copal Enamel	1 4 0
Extra Pale Paper	0 12 0
Best Japan Gold Size	0 10 6
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 8 6
Berlin Black	0 16 0
Knotting	0 10 0
French and Brush Polish	0 10 0

TERMS OF SUBSCRIPTION.

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TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 10 *a.m. on Thursdays*. [N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is stated, nor any list in which the lowest Tender is under 100*l.*, unless in some exceptional cases and for special reasons.]

* Denotes *accepted*. † Denotes *provisionally accepted*.

BARROW.—For erecting a mission-hall on Ramsden Dock-road, for Barrow Island Baptist Mission. Messrs. F. Howarth and W. Wade, architects, Bank-chambers, St. Annes-on-Sea:—

Banks, Edmondson, & Co., School-street Saw Mills, Barrow-in-Furness* £1,808

CARDIFF.—For the erection of new national schools, St. Mary's parish, Cardiff, to accommodate 448 children, with latrines, playsheds, asphalted playgrounds, and boundary walls and gates complete. Messrs. Veall & Sant, architects:—

M. Gibbon & Sons	£7,240	D. Davies & Sons	£6,486
Cox & Bardo	7,096	E. Bevan	6,399
G. Griffiths & Son	7,050	J. Haines & Sons	6,387
Shepton & Sons	7,032	Turner & Sons	6,364
E. H. Page & Co.	6,798	E. R. Evans & Bros.	6,340
J. Gibson	6,795	C. C. Dunn	6,188
G. Hallett	6,770	Knox & Wells	6,145
Melhuish Bros.	6,582	W. Symonds & Co.*	6,038
J. Allan & Sons	6,565		
W. Thomas & Co.	6,545		

[All of Cardiff except Bevan, Penarth.]

CARSHALTON.—For making up Lavender-road, for the Urban District Council. Mr. W. Willis Gale, Surveyor Carshalton:—

Treeby & Co.	£1,085 19 3	J. E. Etheridge	£812 14 4
G. G. Raynes	998 0 0	E. Iles & Son	802 2 8
T. Free & Son	934 0 0	J. May	787 0 0
Ripley, Strong, & Co.	862 4 0	G. W. Ardy, Sutton Common-road, Sutton*	777 16 4
T. Turner	846 1 0		
J. B. Potter	828 19 4		

DOVERCOURT.—For fittings, counters, and showcases, and shop, High-street, Dovercourt, for Messrs. Jenson. Mr. H. Steward-Watling, F.S.A., architect, Kingsway House, Dovercourt, Ipswich, Felixstowe, and Lowestoft:—

E. Saunders, Dovercourt* £97 15 0

DOVERCOURT.—For making and sewering a new road from Lea-road to Monks-road, Dovercourt. Mr. H. Steward-Watling, F.S.A., architect, Kingsway House, Dovercourt, Ipswich, Dovercourt, and Lowestoft:—

E. Saunders, Dovercourt* ..... £260.

DOVERCOURT.—For the erection of two blocks of semi-detached residences, The Avenue, Dovercourt. Mr. H. Steward-Watling, F.S.A., architect, Kingsway House, Dovercourt, Ipswich, Felixstowe, and Lowestoft:—

Rose & Woolnough, Ipswich* £1,330

FELIXSTOWE.—For the erection of a detached residence, Penfold-road. Mr. H. Steward-Watling, F.S.A., architect, 24, Victoria-parade, Felixstowe, Ipswich, Dovercourt, and Lowestoft:—

H. Linzell, Felixstowe—at per schedule.

HERNE BAY.—For sewerage works, West Cliff, for the Urban District Council. Mr. Baldwin Latham, M.Inst.C.E., Parliament Mansions, Victoria-street, Westminster. Quantities by Mr. C. E. Bruges, 1, Victoria-street, Westminster, S.W.:—

S. Pearson & Son, Ltd.	£12,400	J. & T. Binns	£9,628
R. C. Crawford	11,879	A. G. Osenton	9,595
R.H.B. Neale, Ltd.	11,218	J. Ryley	9,406
Lock, Andrew, & Price	11,134	F. Osenton	9,366
H. Hill	11,039	A. E. Goodwin	11,159
W. Underwood & Co.	10,946	J. Morn & Son, Ltd.	9,349
G. Browning	10,896	E. Bentley & Sons	9,182
F. W. Trim	10,415	J. W. Dean, Ltd.	9,012
B. Cope & Co.	10,321	Ingleton Bros.	8,942
Johnson & Langley	10,239	H. B. Smith & Co.	8,776
F. Miskin, Ltd.	9,997	F. M. Saunders	8,638
E. & E. Iles	9,987	J. H. Macdonald	8,618
		G. Bell	8,554
		R. Blackwell & Co., Ltd.	8,245
		Hardy, Bate, & Co., Slough*	7,955

HEXHAM.—For building new nave, Hexham Abbey Church, for Rev. E. Sidney Savage, Rector, for the Committee for the Completion. Mr. Temple Moore, F.R.I.B.A., 37, Old Queen-street, Westminster, London, S.W. Quantities by Mr. J. B. Lofting:—

Holloway Bros., London* £17,465

ILFORD.—For High-street Baptist Church and schools. Messrs. George Baines & Son, architects, 5, Clements-inn, Strand, London, W.C.:—

	Estimate "A."
D. Parkins & Co.	£5,787 0 0
R. G. Walter	5,496 0 0
J. C. Garbett	4,995 0 0
C. North	4,993 0 0
J. Smith & Son	4,944 0 0
Hammond & Niles	4,850 9 10
W. Gregor & Son	4,820 0 0
W. Lawrence & Son	4,784 0 0
H. J. Carter	4,692 0 0
G. Parker	4,687 0 0
Battley, Sons, & Holness	4,687 0 0
A. E. Symes	4,660 11 0
F. J Coxhead	4,655 0 0
W. J. Maddison	4,521 0 0
F. & A. Willmott	4,498 0 0
Mattock & Parsons	4,485 0 0
C. Castle & Son	4,421 0 0
J. S. Hammond & Son	4,404 0 0
Kerridge & Shaw, Stucton-street, Cambridge*	4,444 0 0

* This estimate accepted together with estimates A, B, D, A-1 (a), A-4, A-6, A-7 (b), A-8 (b) A-8, (d), A-8 (e), giving a total of £4,491 2s., which was the lowest Tender submitted.

IPSWICH.—For the erection of a detached residence and motor-house, Rushmere-road, for Mrs. Carlyon-Hughes. Mr. H. Steward-Watling, F.S.A., architect, 4, Tavern-street, Ipswich, Felixstowe, Dovercourt, and Lowestoft:—

H. J. Linzell, Ipswich* £935

KINGSWOOD.—For works of sewerage in Warmley section of the district, for the Urban District Council. Mr. A. J. Salse, A.M.Inst.C.E., Eagle Insurance Buildings, Nicolas-street, Bristol:—

E. Preece	£10,482	R. B. Neal	£6,603
Adams & Jefferies	8,350	T. H. Cooper	6,500
Mereweather	8,763	J. Byard & Son, Gloucester*	6,140
Weigh & Martin	7,090	Brown & Hiscott	4,902
H. V. Smith & Son	6,780		

LANDPORT.—For the erection of a laboratory, etc., in Chandos-street, for Messrs. Timothy, White, & Co. Messrs. Cook & Tutte, architects and surveyors, 894, Commercial-road, Portsmouth:—

J. Munday	£1,335	McCarthy Bros.	£1,076
A. E. Porter	1,327	H. Clark & Son	1,074
J. Durrant	1,215	P. H. Dowdell	1,051
C. & A. Sprigings	1,149	J. Crockerell, Southsea*	992
J. Dutton	1,097		
W. Learmouth	1,083		
W. J. Dugan	1,077		

LONDON.—For proposed residence, Dollis-avenue Finchley, N., for Mr. Frederick Dolman. Messrs. Bennett & Richardson, architects, The Broadway, Finchley, N.:—

MacEwan & Sons £750

LONDON.—New residence, Victoria avenue, Church-end, Finchley, N., for Dr. Vicent Moxey, M.R.C.S. Messrs. Bennett & Richardson, architects, The Broadway, Finchley, N.:—

C. Phillips £900

LONDON.—For residence, The Grove, Church-end, Finchley, N., for Mr. R. J. Bailey. Messrs. Bennett & Richardson, architects, The Broadway, Finchley, N.:—

C. Jackson	£800	Nicholls & Sons	£720
C. W. Scott	800		

LONDON.—For the erection of six shops and station-master's house next Brondesbury Station, for the London and North-Western Railway Co., Ltd. Messrs. Joseph & Smitham, architects, 83, Queen-street, E.C. Quantities by Mr. C. W. Latter, of 14, Great James-street, W.C.:—

G. Simpson & Sons	£3,155	Hudson Bros.	£2 950
W. Smith	3,142	Ford & Walton	2,885
Higgs & Hill	2,984	Ashby Bros.	2 885
Miskin & Son	2,977	G. E. Wallis & Sons*	2,843
Sabey & Son	2,950		

MORLEY.—For erecting weaving shed at Crank Mills, for Mr. J. H. Smith. Messrs. T. A. Buttery & S. B. Birds, architects, Queen-street, Morley, and Leeds:—

Mason: H. Spensley, High-street, Morley	£653 5 0
Joiner: A. Furness, East Park-street, Morley	398 0 0
Plumbers: J. Clegg & Sons, Wesley-street, Morley	64 9 7
Plasterer and Contractor: E. Wilson, Westfield-road, Morley	150 0 0
Slaters: J. Atkinson & Son, Ltd., Leeds	113 0 0
Ironfounders: J. D. Asquith & Son, Morley	237 0 0

NEW BARNET.—For proposed residence in Lyons-down-road, New Barnet, Herts., for Dr. Frankish, M.A.M.B. Messrs. Bennett & Richardson, architects and surveyors, The Broadway, Church-end, Finchley, N. Quantities by the architects:—

Godson & Sons	£1,793	Patman & Fotheringham, Ltd.	£1,653
W. J. Dickens	1,770	Sheffield Bros.	1,650
Wisdom Bros.	1,732	W. Lawrence & Son	1,620
W. Tout	1,705	Mattock & Parsons	1,587
Mattock Bros.	1,700	Gibson & Co.*	1,574
Gough & Co.	1,654		

RUSTINGTON (Sussex).—For erecting two cottages and water supply, for Mr. R. Field, of Loxwood, Billingshurst. Mr. H. G. Heal, Surveyor, Worthing and Littlehampton:—

Chatfield & Son	£560 15 0	Bourne & Jenkinson	£463 0 0
Hulse & Guttridge	557 0 0	T. H. Selby‡	456 0 0
C. J. Drake	504 10 0	A. F. Clark	452 16 0
T. Smith	498 10 0	E. Hill	442 6 6

‡ No tender for water supply.

SLEAFORD.—For erecting a Council school for 630 children, for Kesteven County Council Education Committee. Mr. W. B. Purser, County Surveyor's office, Grantham:—

Kirk, Knight, & Co.	£8,395	C. Wright & Son	£7,770
W. Corah	8,089	F. Evans	7,680
Fish & Son	7,912	A. Faulks	7,548
Hockley & Co.	7,895	H. W. Parker & Son	7,538
H. S. & W. Close	7,868	Banks & Son	7,533
W. H. Maxey & Son	7,850	Wright & Son, Lincoln*	7,442
S. Sherwin & Son	7,797		

STANLEY.—For private street works, for the Urban District Council. Mr. J. Routledge, Surveyor, Council Offices, Stanley, R.S.O.:—

G. E. Simpson	£177 10 2	A. Routledge	£176 10 5
J. McLaren & Son	162 18 3	R. C. Birtley, Stanley*	146 3 9
Johnson & Strong	148 3 10		

TYSELEY.—For the erection of a factory at Tyseley, near Birmingham, for Messrs. J. H. Tucher & Co. Mr. G. A. Cox, architect, 33, Newhall-street, Birmingham. Quantities by Mr. C. Silk, 33, Newhall-street, Birmingham:—

G. H. Marshall	£9,116	Sapcote & Sons	£7,677
T. Mills & Sons	8,869	W. J. Stone	7,632
I. Langley	8,644	Whitehouse & Sons	7,582
W. J. Whittall & Sons	8,497	W. Bishop	7,551
H. J. Pitts	8,198	T. Lowe & Sons	7,495
H. Bryant	7,999	P. Goodwin	7,477
J. Bawm & Sons	7,990	T. Elvins & Sons	7,450
R. Fenwick, Ltd.	7,900	T. Johnson	7,427
H. Allen	7,880	J. Dallow & Sons	7,426
J. Barnsley & Sons	7,866	H. Gibbs, Birmingham*	7,300
W. & J. Webb	7,840	E. Crowder	7,285
F. J. Briley	7,709		

WARE.—For stormwater drain, Star-street, for the Urban District Council. Mr. H. F. Hill, Surveyor, New-road, Ware:—

Hardy, Bate, & Co., Slough, Bucks .. £230 16 4

WATFORD.—For vertically cast-iron pipes for water mains for Nascot House Estate, Watford-crescent, etc., for the Urban District Council:—

Stanton Iron Works	£463 8 6	Cochrane & Co.	£415 2 0
Holwell Iron Co.	454 5 5	Cochrane & Co.	395 13 11
Sheepbridge Iron Co.	439 5 0	Clay Cross Co.	395 11 10
		J. Blakeborough & Sons	390 12 6

WOODFORD.—For the reconstruction of Boys' Department and alterations to Girls' and Infants' Departments, Churchfield Council Schools, Woodford, N.E., for the Essex Education Committee. Messrs. F. Whitmore, 73, Duke street, Chelmsford, and A. Hogwood, 33, Great Tower-street, E.C., joint architects. Quantities by Mr. J. S. Patmenter, Tower-street, Ipswich:—

S. J. Collins	£9,861 14 8	A. Faulks	£8,253 0 0
C. S. Foster & Son	9,230 0 0	Patman & Fotheringham, Ltd.	8 223 0 0
Fitch & Cox	9,163 0 0	J. Chessum & Sons	8,126 0 0
Myall & Upson	9,027 0 0	Hawkey & Oldman	8,105 0 0
I. McKay	8,820 0 0	F. J. Coxhead	8,086 0 0
H. L. Holloway	8,783 0 0	C. & W. Crampton	8,085 0 0
T. Osborn & Sons	8,664 0 0	H. Harris & Son	8,040 0 0
Goddard & Sons	8,661 0 0	J. S. Hammond & Son	7,979 0 0
A. Roberts & Co., Ltd.	8,630 0 0	F. G. Minter	7,955 0 0
F. & A. Willmott	8,631 0 0	Wisdom Bros.	7,900 15 4
F. & G. Foster	8,582 0 0	J. W. Jerram	7,897 0 0
C. Dearing & Sons	8,573 0 0	W. Lawrence & Son	7,894 0 0
Dowsing & Davis	8,513 0 0	Coulson & Lofts	7,829 0 0
C. Wall, Ltd.	8,500 0 0	A. Monk	7,727 0 0
Parkington & Son	8,350 0 0	A. Fairhead & Son	7,711 0 0
Todd & Newman	8,350 0 0	Clark & Sons	7 681 0 0
W. C. Gibbs (Oak Building Co., Ltd.)	8 337 14 0	Rowley Bros.	7,543 0 0
R. Jackson & Co.	8,293 0 0	F. & E. Davey, Ltd.	7,474 0 0
B. E. Nightingale	8,254 0 0	W. Moss & Sons, Ltd.	7,319 4 10
		J. Youngs & Son‡	—

‡ Informal, tender not signed.

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